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ABSTRACT

A project was designed to develop a vocational course to satisfy an industry request for trained manpower in petroleum production. During phase one the feasibility was studied, formal instruction determined, an instructor named, site located and secured, and students selected for the class. A three-year trade and industrial level course for secondary students in grades 10, 11, and 12 was initiated at the start of the 1976-77 school year with thirty-two students enrolled. Strong points of the program were industrial support and donations, efforts of the lay advisory committee, student interest, and employment opportunities. Progress in class development was excellent. A teacher-aide was added to improve instruction, with positive results. An additional aspect of the program was a curriculum development project. A task analysis approach with a survey of incumbent workers to verify the tasks was adopted. The data was processed and teaching steps, objectives, and measurement criteria written. The program displayed many positive features despite many problems encountered, and student applications for the second year were high. Expansion of the building will permit an increase in enrollment. (Appendixes contain a glossary of petroleum production terms, project time schedule, list of tools purchased, and the fifty-page petroleum production task inventory.) (Author/JT)

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FINAL REPORT

VOCATIONAL-TECHNICAL COURSE IN PETROLEUM PRODUCTION

(Project No. ~~19-6010~~ 20-6802
Cont. of 19-6010

Myron A. Crumrine

BRADFORD AREA HIGH SCHOOL

BRADFORD, PA.

January 31, 1978

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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PREFACE

The initiation of anything new usually reveals a myriad of problems. This undertaking proved to be no exception. Legal problems prevented the occupation of the proposed training site at the beginning of the 1976-77 school year. The instructor who had helped design the course was stricken with a heart attack in November and was disabled for the remainder of the year. The most severe winter in recent years made outside activities virtually impossible for approximately ten weeks. The Bureau of Teacher Certification refused to honor a request by the Bureau of Vocational Education that a certificate be initiated and issued for the petroleum production instructional area. This issue has yet to be resolved. These problems made the ordinary class operational nuisances a welcome relief.

Several persons have made contributions to the program and deserve recognition for their assistance. These include Mr. Marcus Herrold, Consultant for Vocational Education Field Services, Mr. Edward Goulding, Supervising Principal of Bradford Area High School, Dr. Stephen Franchak, Research Coordinating Unit of the Pennsylvania Department of Education, and Dr. Merrill Meehan, Educational Curriculum Consultant.

A special recognition is due two individuals; Mr. Frealyn Stark who designed the course and was the initial instructor and Mr. Chester Wolfe who interrupted his retirement to rescue the program by serving as instructor for the remainder of the school year.

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Chapter I

INTRODUCTION

Abstract

This project was designed to develop a vocational course to satisfy an industry request for trained manpower. It was the direct result of a period of investigation which constituted the initial phase of exploration. The result of that study was a recommendation to operate a three year trade and industrial level course designed for secondary students in grades 10, 11, and 12. This course was initiated at the start of the 1976-77 school year with 32 students enrolled.

A number of problems presented themselves during the course of the school year. Some of these were the required inspection by the Department of Labor and Industry, legal complications concerning occupancy, a disabling heart attack suffered by the instructor, severe weather forcing a curtailment of outside activities, and material shortages caused by this curtailment of outside activities and the necessity to provide indoor exercises.

These are but a few of the problems which beset the program. In spite of these the project flourished. Student morale was excellent regardless of what the inconvenience might have been.

Strong points of the program were industrial support and donations, the efforts of the lay advisory committee, student interest, and employment opportunities. Progress in class development was excellent. A teacher-aide was added to the program to improve instruction and the results were easily observed.

Employment opportunities were abundant. The three seniors who sought employment were easily matched with jobs of their choosing and several openings were not filled because of a lack of graduating students.

An additional aspect of the program was a curriculum development project. A task analysis approach with a survey of incumbent workers to verify the tasks was adopted. The data was processed and teaching steps, objectives, and measurement criteria were written. Pertinent illustrations of material unique to the petroleum industry will be included also. This project was designed to incorporate the best features of several curriculum plans.

The program has displayed many positive features in spite of the many problems which the course encountered. During the student applications for enrollment for 1977-78, it was the second most requested course. It has shown a tremendous growth in one year of operation and should continue to be a stable operation in future years. An expansion of the building will permit an increase in enrollment for 1978-79 from 32 students to 40 students.

Methods

The purpose of this project was to initiate and operate a vocational technical course designed to provide instruction for students in petroleum related occupations. This program is not geared toward the laboratory or refinery technician but seeks to provide instruction in the field production aspect of the industry.

During phase one of the project the feasibility of offering formal instruction in this occupational area was studied. Formal instruction was determined to be feasible, an instructor was named, a site located and secured, and students were selected for the class.

The actual operation of the program proved to be anything but smooth. Official notification of approval to operate the course was received in mid August. At this point no tools or class supplies had been purchased. Upon receipt of the notification a concentrated effort was required to gather the necessary items for class operation. Legal problems then became apparent which denied our occupancy of the proposed training site. Class activities were started on the instructor's oil lease until the legal problems were resolved. A solution to these problems was found and the training site was occupied during the third week in October. Just as the class was becoming organized after moving in; the instructor was stricken with a heart attack and disabled for the remainder of the year. It was evident that no certified substitute was available; therefore, with the cooperation of the lay advisory committee a retired oil field supervisor was located and persuaded to teach for the remainder of the year. This caused a change in the direction of the course because the instructor approached the class as a work crew and instructed on an individual basis as the jobs were done. It was our desire to have the

class follow a more traditional path of classroom instruction reinforced by hands on applications. This was not possible with the substitute instructor but his method proved to be successful.

During the year it became apparent that the size of the instructional area (approximately 8 acres) was too large to be monitored by a single instructor. A teacher-aide was added in December, 1976 and the overall instruction was greatly improved. This enabled the instructor to outline a job and rely on the aide to oversee the proper completion of that assignment.

The interruptions of the first year of instruction caused the activities as outlined in the estimated time schedule to be disrupted. (Appendix A). In the findings and analysis section I will outline the disruptions and explain how these were corrected.

After the substitute and aide became acclimated to the class and the course activities the program progressed at a rapid pace. Many positive activities were conducted which resulted in an increase in student knowledge and improvements to the training site. An extensive campaign was also conducted to make the community aware of the program. Included in this campaign were newspaper articles, slide presentations and talks to civic organizations. (Appendix B). The program has been well accepted by the community and local industry.

Chapter II

FINDINGS AND ANALYSIS

This section will be devoted to the activities of phase two of the petroleum production course. I shall approach this from five topical areas. Initially I will outline the course activities and expectations and relate the problems and successes of these. I will then examine the estimated time schedule of events and discuss how successfully these were accomplished. The third topic will be an examination of the ACT testing program and how the results of that test correspond with previously administered tests. A fourth topic will be the activities of the curriculum development project. The final topic will be an examination of the course objectives and the relative accomplishments pertinent to these. These items will cover the activities of phase two of the petroleum production project which span the first full year of operation.

COURSE ACTIVITIES

The final approval to operate the course was received in mid-August. Until that time no supplies and equipment had been purchased for class operation. This had been anticipated but a large effort was required to gather minimal materials necessary to commence operations. The students had been identified and scheduled during the previous school year in anticipation of course approval. Thus that problem was solved and students were scheduled for the petroleum production class on the first day of school. A complete class list may be seen in Appendix C. The investigator from phase one was retained as course instructor, materials and tools were purchased, students were scheduled; therefore, it appeared that all

was in readiness to begin class operation. However, the oil lease, which was very necessary for class operation proved to be a problem. Upon notification that the course had been approved the school solicitor was instructed to finalize the previously negotiated agreement. At the time this seemed like a routine item but a dispute arose concerning the royalty rights to the oil which would be produced. This triggered a period of legal maneuvers and hasseling which prevented occupation of the training site. At this point an alternative plan was developed and implemented to use the instructor's oil lease as a temporary training site. This did not detract from class activities. The proper terminology and nomenclature of the various pieces of machinery were necessary to the initial phase of instruction and were available on the instructor's lease. A tractor shed provided a temporary classroom and shop area for activities during inclement weather. In spite of the inconvenience the class was started and a successful period of instruction was completed. By mid-October the legal problems were solved and the training site was occupied. After a week of moving in and a host of housekeeping chores completed; the course settled into a routine. This routine did not last long because on November 7, 1976 the instructor was disabled with a heart attack. There was no substitute available with any knowledge of the petroleum industry and also no immediate indication of how serious the heart attack was. The supervisor of vocational education served as a substitute and continued class activities as scheduled for a two week period. During that time a doctor's report indicated that the instructor would be disabled for at least six months. With the aid of the lay

advisory committee for petroleum production a substitute instructor was located. This man was a retired supervisor who agreed to interupt his retirement to accept this challenge. The solution of one problem created another. This man was not a trained instructor and did not feel comfortable with classroom instruction. He agreed to assess the tasks which must be done, assign the work and instruct the students on a small group or individual basis. This concept we were able to accept. At this time it became apparent that the scope of the course and the size of the training site were not suitable for a one instructor operation. A teacher-aide was added to the program and this solved a number of problems. The aide was able to oversee assignments made by the instructor and be responsible that the proper techniques for doing the job were observed. This assured better utilization of the instructor in his approach to the class and more practical experiences for the students.

The class activities were concentrated on the job skills listed in the funding request as a course outline (Appendix D). These activities were incorporated into the daily routine. Another problem which was unanticipated was the severe winter which had an impact on the overall program. Instead of a well balanced plan of indoor and outdoor activities as anticipated; all outdoor activities were curtailed. Part of the reason for this was the late date at which the class occupied the lease, thus preventing normal winterization procedures which would prevent freeze-ups of wells and lines. Therefore, with all activities being conducted inside there was a severe strain placed upon materials due to the fact that a total indoor program had not been anticipated. It was during this period that the ingenuity and resourcefulness of the substitute instructor was

fully appreciated. He designed several large welding projects which the students constructed. He also supervised the overhaul and repair of several pieces of equipment. He was able to call upon former collegues for donations of supplies and materials much more efficiently than official requests through channels could be processed. He did an excellent job in a most difficult period. One fact which deserves mentioning is that during all the disruptions and problems the students never complained or lost their enthusiasm.

As the weather mellowed outdoor activities were resumed and the outdoor skills were emphasized. Students were given instruction in welding, pipe fitting, roustabouting, pumping, tractor operation, well pulling, maintenance, carpentry, electricity, and mechanics. Some of these terms may not be familiar to the reader since they are unique to the petroleum industry; therefore, a glossary of terms is included in the report.

If a question were asked about which aspect of the program was most satisfying the response would be the student's enthusiasm. The students never complained about the problems which occurred. They were eager participants in whatever the class activities were. It was never too cold or wet, never too dirty, never boring, never too muddy, and not too physically difficult to suit them. They were a pleasure to observe and work with. Discipline problems were almost non-existent among the group and they displayed a very fine measure of respect for both instructors and the teacher-aide with which they were involved. A total of 32 students were enrolled in the program for the 1976-77 school year. Of that total five were seniors and graduated in the spring.

Two of the students committed themselves to the military service through early enlistments. The other three are employed in petroleum related jobs. We had more than two additional requests for workers from employers; so it would have been easy to have placed all five students in related jobs.

The first year of operation was an interesting experience. It seemed to be a constant exercise in extinguishing brush fires in the form of finding solutions to immediately pressing problems. A great deal was learned from those experiences and many have been eliminated and others do not have the same impact once they have been encountered. I feel the year was very successful, the program has stabilized and is a valuable additon to the school, community and the petroleum industry.

ESTIMATED TIME SCHEDULE

The estimated time schedule found in Appendix "B" was difficult to maintain. Factors already mentioned disrupted the schedule immediately; and it was difficult to return to the schedule as outlined. It should be noted that most of the activities were carried out; although not necessarily as scheduled.

The August activities were conducted as scheduled. In September the disruptions occurred. The ACT testing program was delayed. The introductory phase was started but not on the planned site. A maintenance schedule was not possible at this time. Safety was continually emphasized. The field trip was conducted and the evaluation of the program was a constant activity. The production schedule was another victim of not occupying the oil lease. In October the curriculum development and safety program were a daily activity. The industrial

contacts and support were critical at this time because of the unstable condition of the course. These people were essential to the field trips and resource persons they supplied. We were not prepared at this point to meet with the University of Pittsburgh at Bradford to compare course activities. The October field trip included the drilling operations but also involved the shooting with nitro-glycerin of a drilled well. The production schedule was initiated in late October. The evaluation of the ACT test was impossible because it had not yet been administered. November's activities began with a trend toward stabilization of the schedule. The equipment winterization was completed. Safety and curriculum refinement were daily on-going activities. The maintenance schedule was in operation and the first nine weeks were completed. The introductory tour for prospective students was conducted and the ACT test was administered. November's field trip was a display of electro-logging equipment for electronic evaluation of rock strata within a drilled well. December featured the continuation of the safety emphasis. The snow removal techniques were developed and very necessary. Curriculum, maintenance schedule, and production schedules were expanded and maintained. A field trip was not convenient for the month. A meeting with personnel from the University of Pittsburgh was conducted with an apparent appreciation for the respective programs and a pledge of cooperation as an outcome. The lay advisory committee was extremely active in helping secure a substitute and arranging for industrial donations of supplies and materials. In January the safety program and maintenance schedule were continued. The production schedule and all outdoor activities were canceled due to the extreme cold. A field trip was not possible but a

resource person presented a program of pictures of the inside of wells at different depths. The first semester ended and was evaluated. February found the safety program a continued area of emphasis. The weather remained severe and completely cancelled production. The maintenance schedule consisted of major maintenance of the tractor and overhaul of the pulling pole. There was no field trip conducted during this month. Curriculum development activities were minimal and the dialect continued with the University of Pittsburgh at Bradford concerning cooperative efforts. March brought more pleasant weather conditions and the safety, maintenance and production schedules were resumed as they had been arranged. Curriculum activities were concentrated on outdoor projects. Environmental problems were studied and steps taken to correct some deficiencies. A field trip to the Lawry lease of the maraflood project was conducted. The ACT test results were reviewed with counselors, teachers and students. Industrial contacts indicated that summer opportunities would exist for interested students. The April activities were concentrated on outdoor projects. Safety, maintenance and production schedules were maintained. Environmental corrections and beautification efforts were increased. The field trip was a visit to the oil and gas museum at Custer City, Pa. May was a continuation of the outdoor activities emphasizing safety and following maintenance and production schedules. Maintenance activities were concentrated on restoration of sub-surface equipment in production wells. A field trip was cancelled to allow more time for this activity. Summer shut down procedures were developed and students were given instruction

in job application and helped to locate jobs. June's activities involved lease shut down and an evaluation of the year's activities. An inventory of the tools which were purchased was conducted and tools, equipment and materials were ordered for the 1977-78 school year. (Appendix E)

ACT TESTING PROGRAM

The American College Testing program was included to provide data for comparison purposes relevant to the student selection process. The student selection process was based upon the Differential Aptitude Test results, student academic achievement, attendance and the student's choices of curricular offerings. Critics of such processes ask questions such as: Are the test results reliable? Are students mature enough to make selections which are compatible with aptitudes? Are students of this age sufficiently aware of career opportunities to make wise selections? Are students whose strongest aptitudes and interests are not found in this occupational area made aware of this through counseling?

It was my initial intention to list the students enrolled and the test results and make comparisons on an individual basis. A review of the confidentiality of information law, although not explicit in definition, caused a revison of the proposed evaluation of the data. Therefore, the comparisons will be of a general nature rather than specifically related to individuals.

A total of 26 students were tested with the ACT instrument. Twenty of the students had scores consistent with their indicated career plans. Four were undecided and two students indicated interests in an area unrelated to the occupational training. Six of the students enrolled in the course were not tested.

The twenty students whose scores were consistent with the area of their greatest interest and career goals represented 76% of the students tested having goals and aptitudes consistent with their choice of occupational training. The DAT testing did not prove as conslusive of excellent choices. Of the twenty students who appeared to make excellent career choices according to the ACT test, thirteen or 65% proved to be consistent according to DAT results. This suggests that the ACT instrument, which is based upon interests and experiences in certain fields, may have been prejudiced by the students' involvement in the petroleum occupation which was not the case when the DAT was administered. A larger population would be needed for more conclusive evidence. This conclusion was based upon 73% of the population. Four students were undecided concerning career plans, two were interested in other occupational areas, and six were not tested. Of this six, 2 had withdrawn from school and four were absent when the test was administered. Other comparisons could be made but my main interest is in the area of the student selection and career choices by the students.

CURRICULUM PROJECT

At the suggestion of the RCU agency a formal curriculum project was initiated to compile a comprehensive curriculum in a form which could be easily disseminated. Dr. Merrill Meehan was suggested as a suitable person to head this project. At the initial meeting it was decided that the project would attempt to incorporate the best features of VTECS curricula, the Penn State curriculum materials, and other state related curriculum projects. The first step was a decision to use the VTECS task analysis approach to curriculum development and survey the incumbent

field workers to determine if the tasks were relevant to daily performance in the field. The development of the duties and tasks which were included in the survey instrument was completed with the assistance of the lay advisory committee for petroleum production. The gentlemen who serve on this committee have a varied background in the petroleum industry. Their names and company affiliations may be found in Appendix F. These men have each provided approximately forty hours of their time to help insure the success of this project. The instrument which was distributed included thirteen duties and approximately four hundred tasks. (Appendix G). This did not include the section on tools and equipment.

At this point the size of the questionnaire caused considerable doubt concerning the probable success of the survey. Much discussion was held concerning reducing the duties and tasks but no consensus could be reached among the participants in determining which duties and tasks were unimportant. With this discussion and debate it became apparent that the occupation was a varied type of employment with the incumbent worker posessing a wide variety of skills, some of which overlapped into other occupational areas. It was decided that mailing these questionaires would be useless with the population we were attempting to survey. Therefore, a face to face request to participate in the survey was adopted with a subsequent call to retrive the instrument. Two individuals did a yoeman job in this phase of the project, Mr. LeRoy Cullen and Mr. Chester Wolfe. A population of two hundred and fifty workers was identified and a return of 159 was achieved. This is a return rate of 64% which is an excellent return in any project and an exceptional return in a survey where the instrument is as large as this.

This rate of return insured that the data was valid.

At the conclusion of the survey the data was key punched and processed by a computer. Dr. Meehan was able to obtain the services of the VTECS center in Atlanta, Ga. to process the data. This has been done and the project is currently involved in the development of teaching steps for each task and performance objectives and measurement criteria.

This material will be supplemented by illustrations of various techniques unique to petroleum production which will be included in the final document. Materials which have been developed in areas such as carpentry, pipe fitting, electricity, auto mechanics, and welding will be adapted to applications related to the petroleum industry. Therefore, it will not be necessary to re-write these tasks for previously established curricula. The finished document will be submitted to the Research Coordinating Unit and made available to the VEIN network.

OBJECTIVES

1. To train approximately 40 high school students, grades 10, 11, and 12, for employment in the petroleum industry or related areas; thus making an opportunity for employment which will encourage students to remain in the community:

   The size of the shop laboratory limited the initial enrollment to 32 students. An Appalachia grant has been obtained to increase the size of the shop-laboratory by 720 sq. feet to a total of 2304 sq. feet. This will enable us to increase the enrollment to 40 students. Employment opportunities do exist in the Bradford area for trained oil field personnel.

2. To identify new strategies for communication and cooperation between the public schools, the University of Pittsburgh's petroleum technology course, and local industry:

   Much has been accomplished in this area. Industrial assistance has been received in both cash contributions and in-kind services. The Appalachia grant which provides for the purchase of a new bulldozer and a 20' x 36' addition to the shop-laboratory has been supported by industrial donations to supply the local share of 20% of the project total. In kind donations of nearly $75,000. have been received also. The cooperation between the University of Pittsburgh at Bradford and the Bradford Area High School is also very positive. Arrangements are currently underway for a summer course to be offered by U.P.B. using the Bradford Area High School's lease as a training site. The allowance of 6 credits toward the associate degree in petroleum technology for graduates of the high school's petroleum production course is also being arranged. The industry has also recognized that the two programs have entirely different themes and each will contribute to the petroleum industry.

3. To provide live work experiences on the training site which will encompass all areas of the petroleum production occupation:

   The use of an operating oil lease as a training site rather than a classroom simulation makes it possible to achieve this objective. Wells are pumped, pipelines laid and repaired, tanks set, equipment is repaired and a multitude of other related tasks are completed daily. Instruction in the theory and the actual application of that knowledge is essential to training for this occupation.

4. To provide the student with entry level skills which will encompass the many and varied activities which a skilled oil field worker encounters:

   This objective has been met very throughly. A student is exposed to all facets of the daily operation of an operating oil lease. Instruction is built around the solution of the problems of production and the correct techniques of new developments and installations.

5. To meet an industry need by supplying young able bodied workers who have had formalized training in the occupational areas of petroleum production:

   During phase one the research conducted concerning the industry's manpower needs was conclusive that a need for trained personnel exists and will exist for many years. This is substantiated by the placement of the 1976-77 graduating class. Five students graduated from the program. Of these five, two enlisted in military service and the remaining three are employed in the petroleum industry. There were several requests for workers which we were unable to respond to.

6. To develop a formalized course of study and training program for the petroleum industry which has never attempted any organized training for production workers in this geographic location:

   a. To design the course to meet or surpass the latest Department of Labor and Industry, OSHA safety requirements and the regulations of the Department of Environmental Resources.

   b. To develop a curriculum based upon community, education and industry needs.

c. To simulate an industrial atmosphere in which job attitudes, performances and expectations are stressed.

This objective while somewhat lengthy involves the formalization and development of a curriculum for this instructional area. This project is currently underway and addresses itself to the many aspects mentioned in the objective. It has been developed in cooperation with the lay advisory committee and is built around a task analysis approach including a survey of incumbent field workers. This document will be printed in the near future.

7. To provide training in a skill area which meets the career needs and desires of students from a rural community, many of whom wish to pursue a career whose activities are basically of an outdoor nature:
In conferences with the students who are enrolled in the course the one item which invariably is mentioned is the fact that the student wishes to be outdoors. The wooded rural area lends itself to the development of this desire by the recreational activities available here such as hunting, fishing, boating, skiing, snowmobiling, and ice skating. Children raised in this atmosphere often feel stifled in an indoor setting or an occupation whose activities are indoor by nature. This occupation permits a student to earn a good wage and enjoy the freedom of working outside.

8. To improve the negative image of oil field work and workers in regard to wages and working conditions by providing career guidance pertinent to the industry:
The recent increases in crude oil prices and the shortage of qualified workers have improved the industry's wage structure.

These improvements in wages and fringe benefits have done much to improve the negative image of the field worker. Modern techniques have improved the safety of the occupation and this has also helped remove negative attitudes. Field trips have been conducted to familiarize the students with modern oil field techniques, resource persons have been used to point out opportunities for young persons in the industry and guidance counselors have also covered job opportunities, educational opportunities, and the expectations of the students.

9. To establish a cooperative summer employment program for enrolled students:

This project was not formalized this past summer. Two requests for students to work in summer jobs was handled through the vocational office and four students found their own jobs in petroleum related areas. This program will be given more attention during the 1977-78 school year.

Chapter III

CONCLUSIONS AND RECOMMENDATIONS

The activities of one year of operation of a vocational course in petroleum production at Bradford Area High School have been listed in the previous chapters. Examination of this year's activities enables us to draw the following conclusions and make these recommendations:

CONCLUSIONS

1. The petroleum industry and related industries have demonstrated excellent support for the operation of this course.
2. Employment opportunities exist and all indications are that an even greater demand for trained personnel will be present in the future.
3. That the course does meet a school, community, industry, and student need by providing training in this occupational area.
4. That the program is expensive to operate and would not be possible without the cooperation of the agencies involved and the industrial donations.
5. That close cooperation has been fostered between the University of Pittsburgh at Bradford and the Bradford Area High School, and this cooperation has spread to other subject areas since its initiation concerning the petroleum production course.
6. Course activities being conducted on an operational oil lease are more realistic than any possible through simulation in a shop or classroom and the students are more receptive to this approach to instruction.

7. The on site training coupled with the long range plans for the program will make this lease a model in terms of general upkeep and will meet or surpass environmental regulations.
8. That an instructor can be found and sufficient interest in the project exists to attract others to seek this position if it becomes available.
9. Student interest is strong in this occupation and employment opportunities will encourage students to stay in the Bradford area.
10. The Bradford Area Board of Education is prepared to support this course by assuming the full burden of the program when the current project funding has terminated.

RECOMMENDATIONS

1. That a successful year of operation be considered as proof that the course is feasible and that funding be continued to fully develop this curricular area.
2. That persons at the state level share in the local pride that this is the only project of its kind at a secondary level in the nation.
3. That the program be presented by the Research Coordinating Unit at the 1978-79 AVA convention.
4. That the efforts of the lay advisory committee be publicized state wide. This project could not have succeeded without them.
5. That the possibility of the development of a VTECS catalog for petroleum production be explored.

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GLOSSARY

Bailer, piece of equipment used to remove cuttings and mud from hole when drilling

Bailing Machine, is a machine used to bail water or oil from a gas well.

Bit, tempered piece of iron, which is dressed to guage and wedge shaped. Used to cut hole by a rotating up and down pounding motion.

Bull Wheels, name given to the drum which spools the drilling line. located on a spudder drilling rig.

Cable Tools, A method of percussion drilling where a hole is literally pounded into the ground--machines such as standard rig, parkersburg, national and spudder are in this category.

Cat Line, is a rope which is used on a spudder for lifting heavy equipment.

Coring and Chipping, Methods of extracting oil producing sand samples from a well for laboratory analyzing.

Crumbies, is a special type of wrench used for setting and breaking joints on tubing.

Driller, a person hired to operate a drilling rig, and has the knowledge of basic drilling.

Five-Spot, method of developing a lease in a checker-board pattern by drilling four intake wells with a single producing well in the center.

Fracturing, the actual cracking or breaking of the oil bearing sand formations by injecting a fluid under tremendous pressure on the sand formation.

Grass hopper Jack, a common jack used with a central power. Converts horizontal motion to vertical motion.

Guage Pole, is a calibrated stick in feet and inches. This is used to gauge the amount of oil in the storage tank.

Hot tube, a type of engine used to run central pumping powers. Is considered obsolete today.

Injection or Intake Well, well used to carry water to the oil bearing sands for the purpose of forming and moving an oil bank to the producing well.

Lead Line, is the name given to the line from the well to the storage tank. This line carries the pumped fluid.

Pony Beam Jack, above ground equipment located over producing oil well and used for pumping the oil well in connection with a central pumping power.

Power House, a building containing the source of power centrally located to pump a group of wells.

Producing Well, well used for the purpose of obtaining the crude oil from the oil bearing sand formations.

Pulling Crew, a group of production workers consisting of one tractor driver and one or two men with duties under the pulling pole.

Pulling Pole, usually made of pipe. This piece of equipment is used to pull tubing and rods for the repair of a producing well.

Pulling Tractor, is some type of tractor with a pulling winch. Is used with a pulling pole.

Pumper, name given to the oil field production worker who has the responsibility of checking the oil producing wells for maintenance problems and correct pumping schedules. This may be on pony beam jacks connected to a central pumping power or on individual units such as electric jacks.

Rabbit, is the name given to a bar, which is put in tubing to make sure the pipe is clear of debree.

Rotary, a drilling machine employing a turning and grinding method of drilling.

Roughneck, name given to the non-technical drilling crew worker.

Roustabout, name given to the non-technical production oil field worker.

Sand line, is the name given to the cable which runs the bailer.

Secondary Recovery, method of oil recovery employing the five-spot method of drilling and water injection.

Seperator, a tank like device, used to separate salt water from crude oil.

Shooting, the process of creating a cavity in the oil bearing sand, after a well has been drilled, by setting off a charge of nitro-glycerin that had been lowered to the sand formation

Spider and Slips, piece of equipment used to hold tubing when pulling a well.

Spudder, a drilling machine employing a percussion method of drilling.

Standing Valve, stationary valve seated below the barrel, which allows fluid to enter the barrel and not leak back.

Stationary Engineer, oil field production worker with specific duties in a water plant, central pumping power, or pump station such as minor machinery maintenance; operation of engines, motors, powers, triplex pumps, centrifugal pumps, filters, chemical feeders, etc.; reading and recording of gauges, meters, and recording charts.

Surface Rod Lines, name given to the rod lines that connect the central pumping power to the grasshopper jack.

Tank Battery, a series of storage tanks placed together at one location.

Tertiary Recovery, third method of oil recovery employing such means as combustion, steam, maraflood, etc.

Tool Dresser, a person that is hired to do general duties around the rig other than drilling.

Traveling Valve, a valve which moves in an up and down motion inside the working barrel which forces the fluid to the surface.

Well logging, a sub-surface survey of the formations and sands of an oil or gas well. Accepted source of determining how to frac the well and location of sands.

Wild catting, drilling at random at any given place, without proof of production.

Working Barrel, the actual sub surface pump located near the bottom of a producing oil well and used to pump the crude oil to the surface.

APPENDIX A

Estimated Time Schedule

Identify and correct safety hazards

Evaluate available equipment

Aug. Make industry contacts

Gather instructional materials

Plan introductory phase of petroleum course

Administer ACT testing Program

Begin introductory phase of instruction

Sept. Develop a schedule for maintenance

Develop and implement safety program

Field trip-Rotary & Cable tool drilling operations

Evaluate first month of instruction

Implement production schedule

Continue to develop curriculum

Emphasize safety aspects of occupation

Maintain industrial contacts

Compare planned course with University of Pittsburgh at Bradfords' Petroleum technology course and share materials

Oct. Begin career awareness program (resource persons, guidance, counselors, etc.)

Field trip-rotary & cable tool drilling operations

Continue production schedule

Evaluate ACT Testing Program

A. Return results and interpret material with students

B. Compare with other data

Begin to winterize equipment

Continued emphasis upon safety

Refinement of curriculum with emphasis upon outside activities

Carry out maintenance schedule

Nov. Evaluate first nine weeks with student questionaires, industrial, administrative and instructor's input.

Conduct introduction tour for prospective students (1977-78 school year)

Field trip-well fracturing and shooting

Continue and up date production schedule

Emphasize safety programs

Develop snow removal techniques

Continued curriculum development, with emphasis on cold weather clothing and care of equipment.

Dec. Follow maintenance schedule

Field trip-Tertiary Recovery-Maraflood Project

Maintain and expand industrial contacts

Continue production schedule

Emphasize safety program

Follow maintenance schedule

Follow production schedule

Continue curriculum development emphasizing cold weather problems, trouble shooting and outdoor winter work techniques.

Field Trip-oil well logging and perforating

Evaluate first semester activities

A. Student input

B. Industrial input

Jan.	C. Staff (instructor-Guidance) and administrative input.
	Emphasize safety program
	Follow maintenance schedule
	Follow production schedule
Feb.	Continue curriculum development
	Field trip-oil refining and packaging plant
	Investigate possible cooperation with University of Pittsburgh for common use of facilities and materials.
	Emphasize safety program
	Continue Maintenance schedule
	Follow production schedule
March	Continue curriculum development
	Begin to correct environmental problems
	Field Trip-oil production shop
	Begin industry contacts to develop summer work experience cooperative program.
	Emphasize safety program
	Continue maintenance schedule
April	Follow production schedule
	Continue curriculum development
	Field trip-water plant and water analysis laboratory
	Begin beautification program
	Continue work on environmental problems

Emphasize safety program

Continue maintenance schedule

Follow production schedule

May — Continue curriculum development

Field trip-transportation of crude oil

Develop summer shut down procedure

Match interested students with available summer jobs through cooperative program.

Shut down lease

Evaluate years activities

June

A. Student input

B. Industrial input

C. Staff and administrative input

Prepare and submit final reports for year's program.

APPENDIX D

36

Oil related job skills that will be taught in a 3 year oil production course at the Bradford Area Senior High School.

1. Tool recognition and correct useage
2. Pipe fitting
3. Oil well pulling
4. Well plugging
5. Pumping jack maintenance and erection
6. Pumping
7. Roustabouting
8. Tractor and bulldozer operation
9. Trouble shooting an internal combustion engine
10. All types of oil field maintenance problems
11. Well drilling
12. Basic oil field welding
13. Basic oil field carpentry
14. Basic oil field electricity
15. Basic oil field mechanics

Note: In all of the above skill areas good work habits and safety will be stressed.

APPENDIX E

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TOOLS PURCHASED

1 Welding & Cutting Outfit complete with welding torch, cutting attachments, regulators, twin neoprenehose, etc.

1 225 Amp. DC Arc Welder & AC power generator portable welder for field erection and repair

1 Accessory set for above includes cable, helmet, electrode holder, etc.

1 1" to 2" Pipe Threader

1 1/4 x 1" NC OORB Die w/Head

1 1/4 x 1" NC OORB Dies only

1 Heavy Duty #2A pipe cutter

1 Bx.Heavy Duty #2 Pipe Cutter wheels (12)

1 Low Grip Pipe Reamer #2

1 Gallon - Dark Cutting Oil

1 Yoke Bench Pipe Vise

1 Mall. Iron Comb. Pipe Vise

1 Straight Pat. Pipe Wrench 6"

1 Straight Pat. Pipe Wrench 8"

1 Straight Pat. Pipe Wrench 10"

1 Straight Pat. Pipe Wrench 12"

1 Straight Pat. Pipe Wrench 14"

2 Straight Pat. Pipe Wrench 18"

2 Straight Pat. Pipe Wrench 24"

1 Straight Pat. Pipe Wrench 36"

1 12" Monkey or Spud Wrench

1 Post Hole Digger

1 Scythe Blade - Light weight - Weed

1 Scythe Blade - Hvy. weight - brush

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2	Snath-Aluminum
1	4½' one-man cross cut saw
1	Snatch Block 10" pulley
1	3-ton capacity Hoist (chain)ftg.
2	5-ton Track Jack
1	1-1/2 ton Hydraulic Jack
1	Tubing Tongs (2" pipe)
1	5/8 x 150' 19 x 7 Non-rotating Tubing Line 78'
1	1/4: to 1" N.C. Bolt Dies #OOR-B
1	Set Standard N.C. Hand Taps-High Speed Steel of both taper & bottoming taps 1/4, 3/8, 1/2, 5/8, 3/4, 7/8, and 1"
1	Set standard Taper Pipe Taps-High Speed Steel 1/8, 1/4, 3/8, 1/2, 3/4, 1, 1 1/4, 1 1/2, 2"
1	Set Screw Extractors #1816
1	Set Screw Extractors #1822
1	Screw Pitch Gage for pipe and nuts and screws
1	Jobbers Straight Shank High Speed Steel Twist Drill Set 1/16" to 1/2" by 64ths
1	Set 1/2" Straight Shank High Speed Steel Twist Drills 9/16", 5/8, 11/16, 3/4, 13/16, 7/8, 15/16, 1"
1	Soldering Gun
1	1 lb. spool Acid-Core Solder
1	1 lb. spool Plastic Rosin-Core Solder
1	Heavy Tin Snips - 12 to 14"
2	Heavy Duty Lever Grease Guns (Cartridge Type #1169)
2	Force Feed Oilers (1½ Pt.)
2	Force Feed Oilers (1 Qt.)
2	Galvinized Combination Measures (2 Qt. Cap.)

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1	Copper Tubing Flaring & Cutting Tool Kit
1	Thickness Gage
1	100' Steel Tape
4	Tape-Rules 10'
1	Carpenter's Steel Square 2'-24 x 2" Body
1	24" Aluminum Level
1	Ratchet Bit Brace - 10" Sweep
1	Auger Handle
1	Auger Bit Set-1/4,5/16,3/8,7/16,1/2,9/16,5/8,11/16,3/4,13/16,7/8, 15/16 & 1"
1	Expansive bit & cutters-7/8, to 1 3/4 & 1 3/4 to 3"
1	Set ship Augers-1/2", 5/8, 3/4, 7/8, 1"
1	12" or 14" Jack Plane #1205
1	Set Wood Chisels-1/4, 3/8, 1/2, 3/4, 1 & 1½"
3	Phillips Screwdrivers
6	Regular Screwdrivers
1	Pr. Channellock pump pliers
2	Lineman's Heavy pliers
1	Lineman's Insulated Side Cutting Pliers
1	Diagonal Cutting Pliers
1	Needle Nose Pliers
4	Cold chisels-1/2, 5/8, 3/4, 1"
3	Half Round chisels-1/8, 1/4, 3/8
3	Diamond Point Chisels 1/3, 1/4, 3/8
1	Set Drive Pin Punches (All sizes)
2	Center Punches

2	Ripper Hammers bell face St. Claws
3	Ball Pein Hammers Different Sizes
4	Lead Hammers 21 lb.
2	Double Bit Axes
1	Pruning Saw - 24" blade
1	26" Hand Saw-Crosscut
1	26" Hand Saw-Rip
2	Hacksaw Frames
1	1/2" sq. drive-12 point-socket wrench set
2	Adjustable wrenches in the following sizes: 4, 6, 8, 10, 12, & 18
2	Vise-grip wrenches 1-7" a 1-10"
2	Round point-solid shank-contractors'weight shovels
1	Square point solid shank-contractors' weight shovels
1	5/8 x 18"; 1 3/4 x 24" wrecking bars
2	5' Pinch bars
1	Railroad or clay pick
1	Mattock
1	Brush hook
1	12 lb. Cross Pein sledge
1	14 lb. Cross Pein sledge
6	Chains, 1/4, 3/8, 1/2, 9/16, different lengths
1	24' single ladder (wood)
1	8' Mechanics' step ladder
2	Putty knives
2	Paint or wall scrapers
1	AC Volt Ammeter

1 3/8" heavy duty portable electric drill

1 1/2" heavy duty portable electric drill

1 7"-8" heavy duty portable electric saw

1 6"-8" heavy duty ball bearing D.E. bench electric grinder

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APPENDIX F

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PETROLEUM PRODUCTION LAY ADVISORY COMMITTEE

Dale Fox	Vice President	Witco Chemical Co.
Gilbert Ledebur	Superintendent	Quaker State Oil Ref. Corp.
Earl Carlson	Owner	E. E. Carlson Oil Co.
Duane Piper	Owner	Piper Oil Surveys
Willard Cline	Self Employed	Independent Oil Producer
Warren Paynter	Senior Engineer	Pennzoil Co.
E. J. Bryner	President	Pennsylvania Oil, Gas, & Minerals Association
William Kaschube	General Manager	Hanley & Bird Co.
Fred Dittman	Owner	Dittman Drilling Co.
Chester Wolfe	Superintendent	Pennzoil Co. (Retired)

APPENDIX G

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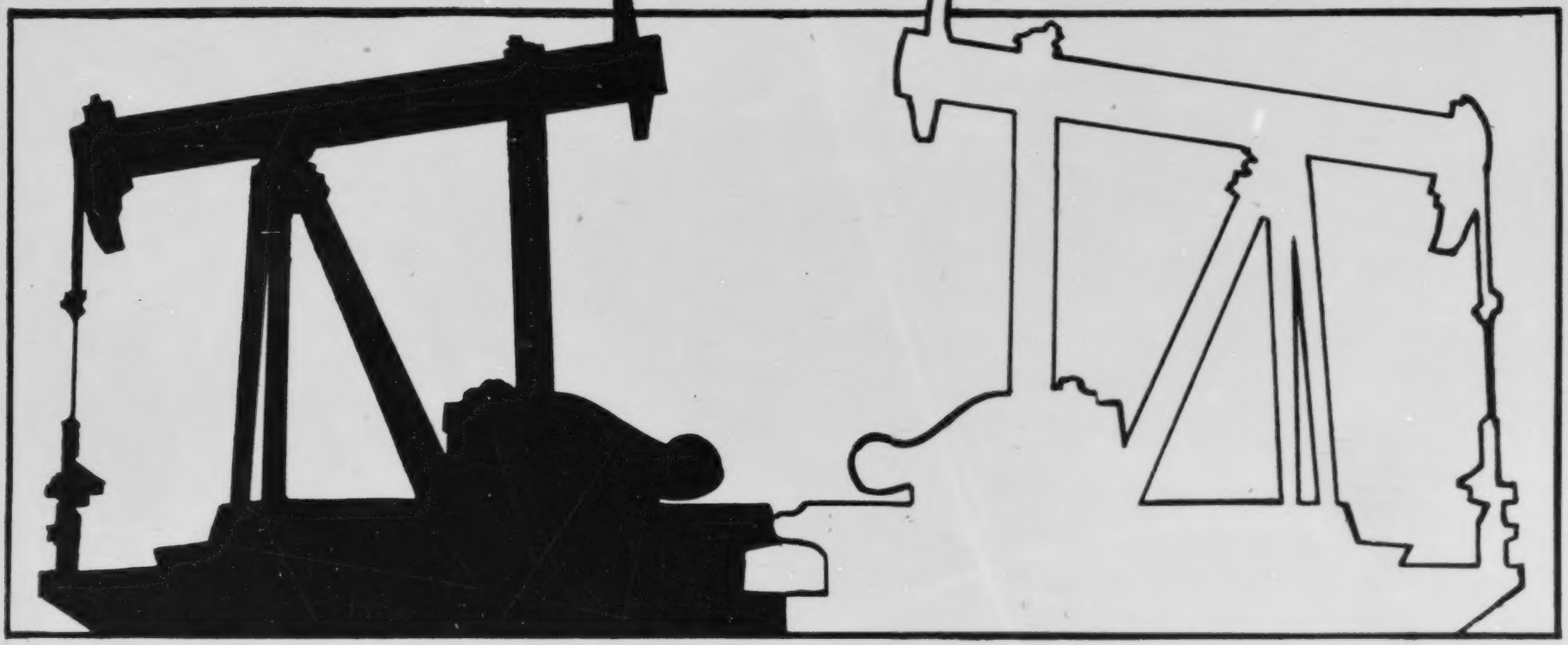
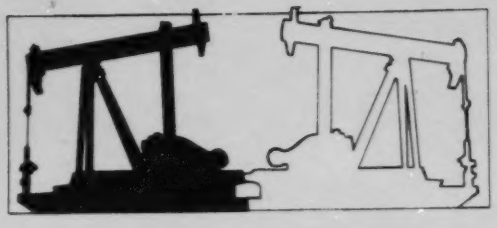
BRADFORD AREA HIGH SCHOOL



PETROLEUM PRODUCTION
SURVEY

booklet no. 154
D.O.T. code number:

This activity is a portion of a research and demonstration project sponsored by the Research Coordinating Unit for Vocational Education, Pennsylvania Department of Education



BACKGROUND INFORMATION

FOR OFFICE USE ONLY

PROJECT IDENTIFIER	(01-04)	01
BOOKLET NUMBER	(05-08)	
O. E. CODE	(09-14)	
D.O.T. CODE	(15-23)	

PLEASE PRINT ALL REQUESTED INFORMATION

NAME (24-75)

ADDRESS

SEX (CHECK BOX) M☐ F☐ (01) 02

TOTAL TIME ON PRESENT JOB YRS:_____ MONTHS:_____ (02-04)

TOTAL TIME IN CAREER FIELD YRS:_____ MONTHS:_____ (05-07)

PRESENT POSITION OR JOB TITLE: (08-29)

NUMBER OF PERSONS SUPERVISED: (30-31)

NAME AND ADDRESS OF EMPLOYER (32-75)

PLEASE CIRCLE YEARS OF EDUCATION COMPLETED

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 (76-77)

Booklet No. (78-80)

PETROLEUM PRODUCTION

BRADFORD AREA HIGH SCHOOL

INSTRUCTIONS

This is a practice exercise. Follow these steps:

FIRST: Carefully read each task statement and place a check (✓) mark in the column labeled check for each task which you perform on your present job.

SECOND: Add one task you perform on your present job that is not listed in this practice set of tasks.

THIRD: After checking all the tasks which you perform, now rate those tasks which you checked. A scale of numbers from 1 to 7 is provided in the right hand column. These numbers represent an estimate of time spent performing the task. For example, a pumper spends an average amount of time performing the task "checking the well for pumping off". Thus, this would be rated the number four - average. The number four is written in the column next to the check mark. A task requiring "very much above" average time is rated a seven; a task requiring "very much below" average time is rated a one. Other time ratings available are 2, 3, 5, 6 and are explained at the top of the column.

PETROLEUM PRODUCTION TASK INVENTORY - 77 LISTED BELOW ARE A DUTY AND THE TASKS WHICH IT INCLUDES. CHECK ALL TASKS WHICH YOU PERFORM. ADD ANY TASKS YOU DO WHICH ARE NOT LISTED, THEN RATE THE TASKS YOU HAVE CHECKED. DUTY: 00 PRACTICE EXERCISE	CHECK ✓ If Done	TIME SPENT 1. Very Much Below Average 2. Below Average 3. Slightly Below Average 4. About Average 5. Slightly Above Average 6. Above Average 7. Very Much Above Average
00 01 Raise the pulling pole		
00 02 Run pony string and packer		
00 03 Place bottom hole bridge		
00 04 Heat run tank		
00 05 Dress and gage drilling bit		
00 06 Drain all gas line drips		
00 07 Weld a double vee butt joint vertical in aluminum		

TABLE OF CONTENTS

This booklet is divided into two sections. Section I is a list of job duties and Section II is a list of tools. For Section I please check the box of those job duties that you are required to perform in your present job. Note that there is a page number for each box that you checked. Everyone is to respond to Section II, Tool and Equipment usage.

Now turn the page for the first box that you checked.

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☐ 02 SERVICING INJECTION WELLS 7

☐ 03 PLUGGING OIL WELLS 8

☐ 04 PLUGGING INJECTION WELLS 10

☐ 05 PUMPING OIL WELLS (ELECTRIC JACK) 11

☐ 06 DRILLING OIL, GAS AND SERVICE WELLS 12

☐ 07 MAINTAINING CENTRAL PUMPING POWER, ELECTRIC PUMPING JACK OIL, GAS & WATER LINES, AND WATER PRESSURE PLANT 14

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SECTION I

JOB DUTIES AND TASKS

PETROLEUM PRODUCTION

BRADFORD AREA HIGH SCHOOL

PETROLEUM PRODUCTION TASK INVENTORY - 77		CHECK ✓ If Done	TIME SPENT 1 Very Much Below Average 2 Below Average 3 Slightly Below Average 4 About Average 5 Slightly Above Average 6 Above Average 7 Very Much Above Average
LISTED BELOW ARE A DUTY AND THE TASKS WHICH IT INCLUDES. CHECK ALL TASKS WHICH YOU PERFORM. ADD ANY TASKS YOU DO WHICH ARE NOT LISTED, THEN RATE THE TASKS YOU HAVE CHECKED. DUTY: 01 SERVICING OIL WELLS			
01 01 Ascertain problem from pumper	(03:5)		
01 02 Identify servicing equipment and tools	(6)		
01 03 Select tools needed for job	(7)		
01 04 Transport servicing equipment to site	(8)		
01 05 Prepare the location for servicing well	(9)		
01 06 Release gas pressure	(10)		
01 07 Prepare well for servicing	(11)		
01 08 Raise the pole	(12)		
01 09 Remove the well head equipment	(13)		
01 10 Pull the rods	(14)		
01 11 Rig up the double line	(15)		
01 12 Insert the lifting nipple	(16)		
01 13 Pull and inspect the tubing	(17)		
01 14 Remove working barrel	(18)		
01 15 Inspect working barrel	(19)		
01 16 Inspect the perforation and anchor	(20)		
01 17 Replace the working barrel	(21)		
01 18 Rerun the tubing	(22)		
01 19 Space the tubing	(23)		
01 20 Inspect all gaskets	(24)		
01 21 Rerun the rods and space	(25)		
01 22 Reconnect the jack	(26)		
01 23 Determine if it is pumping properly	(27)		
01 24 Remove pole and pulling equipment	(28)		

PETROLEUM PRODUCTION TASK INVENTORY - 77	CHECK ✓ If Done	TIME SPENT
LISTED BELOW ARE A DUTY AND THE TASKS WHICH IT INCLUDES. CHECK ALL TASKS WHICH YOU PERFORM. ADD ANY TASKS YOU DO WHICH ARE NOT LISTED, THEN RATE THE TASKS YOU HAVE CHECKED.		1 Very Much Below Average 2 Below Average 3 Slightly Below Average 4 About Average 5 Slightly Above Average 6 Above Average 7 Very Much Above Average
DUTY: 01 SERVICING OIL WELLS (CONTINUED)		
01 25 Clean up location (29)		
01 26 Maintain proper pulling records (30)		

PETROLEUM PRODUCTION TASK INVENTORY - 77		CHECK ✓ If Done	TIME SPENT (1 Very Much Below Average, 2 Below Average, 3 Slightly Below Average, 4 About Average, 5 Slightly Above Average, 6 Above Average, 7 Very Much Above Average)
LISTED BELOW ARE A DUTY AND THE TASKS WHICH IT INCLUDES. CHECK ALL TASKS WHICH YOU PERFORM. ADD ANY TASKS YOU DO WHICH ARE NOT LISTED, THEN RATE THE TASKS YOU HAVE CHECKED. DUTY: 02 SERVICING INJECTION WELLS			
02 01 Ascertain problem from meter reader	(31)		
02 02 Identify servicing equipment and tools	(32)		
02 03 Select tools needed for job	(33)		
02 04 Transport servicing equipment to site	(34)		
02 05 Prepare the location for servicing well	(35)		
02 06 Release gas pressure	(36)		
02 07 Shut off line pressure	(37)		
02 08 Allow well to backflow	(38)		
02 09 Raise the pole	(39)		
02 10 Remove wellhead fittings	(40)		
02 11 Ream and flush tubing with pony string	(41)		
02 12 Remove pony string and reamer	(42)		
02 13 Run pony string and packer	(43)		
02 14 Set packer	(44)		
02 15 Clamp and draw tight pony string	(45)		
02 16 Connect pressure lines	(46)		
02 17 Check for leaks	(47)		
02 18 Remove pole	(48)		
02 19 Clean up location	(49)		
02 20 Read the meter	(50)		
02 21 Notify water plant operator	(51)		
02 22 Maintain well records	(52)		

PETROLEUM PRODUCTION TASK INVENTORY - 77		CHECK ✓ If Done	TIME SPENT
LISTED BELOW ARE A DUTY AND THE TASKS WHICH IT INCLUDES. CHECK ALL TASKS WHICH YOU PERFORM. ADD ANY TASKS YOU DO WHICH ARE NOT LISTED, THEN RATE THE TASKS YOU HAVE CHECKED.			1 Very Much Below Average 2 Below Average 3 Slightly Below Average 4 About Average 5 Slightly Above Average 6 Above Average 7 Very Much Above Average
DUTY: 03 PLUGGING OIL WELLS			
03 01 Obtain state permits	(53)		
03 02 Review well records	(54)		
03 03 Identify servicing equipment and tools	(55)		
03 04 Select tools needed for job	(56)		
03 05 Transport servicing equipment to site	(57)		
03 06 Dig overflow pit	(58)		
03 07 Shut off injection wells	(59)		
03 08 Prepare the location for servicing well	(60)		
03 09 Prepare well for servicing	(61)		
03 10 Release gass pressure	(62)		
03 11 Raise the pole	(63)		
03 12 Remove wellhead equipment	(64)		
03 13 Pull the rods	(65)		
03 14 Rig up the double line	(66)		
13 15 Insert lifting nipple	(67)		
13 16 Pull tubing	(68)		
03 17 Obtain plugging materials	(69)		
03 18 Place bottom hole bridge	(70)		
03 19 Run bridging material	(71)		
03 20 Spot cement through pipe	(72)		
03 21 Repeat bridge for each producing sand	(73)		
03 22 Set bridge below casing seat and cement	(74)		
03 23 Backfill hole or casing to surface	(75)		
03 24 Set 2" monument 3' above ground	(76)		

PETROLEUM PRODUCTION TASK INVENTORY - 77	CHECK ✓ If Done	TIME SPENT
LISTED BELOW ARE A DUTY AND THE TASKS WHICH IT INCLUDES. CHECK ALL TASKS WHICH YOU PERFORM. ADD ANY TASKS YOU DO WHICH ARE NOT LISTED, THEN RATE THE TASKS YOU HAVE CHECKED. DUTY: 03 PLUGGING OIL WELLS (CONTINUED)		1 Very Much Below Average 2 Below Average 3 Slightly Below Average 4 About Average 5 Slightly Above Average 6 Above Average 7 Very Much Above Average
03 25 Remove pole (77)		
03 26 Fill overflow pit (78)		
03 27 Clean up location (79)		
03 28 Seed location (80)		
03 29 Submit plugging record (04:5)		

PETROLEUM PRODUCTION TASK INVENTORY - 77		CHECK ✓ If Done	TIME SPENT
LISTED BELOW ARE A DUTY AND THE TASKS WHICH IT INCLUDES. CHECK ALL TASKS WHICH YOU PERFORM. ADD ANY TASKS YOU DO WHICH ARE NOT LISTED, THEN RATE THE TASKS YOU HAVE CHECKED.			1 Very Much Below Average 2 Below Average 3 Slightly Below Average 4 About Average 5 Slightly Above Average 6 Above Average 7 Very Much Above Average
DUTY: 04 PLUGGING INJECTION WELLS			
04 01 Obtain state permits	(6)		
04 02 Review well records	(7)		
04 03 Identify servicing equipment and tools	(8)		
04 04 Select tools needed for job	(9)		
04 05 Transport servicing equipment to site	(10)		
04 06 Dig overflow pit	(11)		
04 07 Shut off well	(12)		
04 08 Prepare the location for servicing well	(13)		
04 09 Prepare well for servicing	(14)		
04 10 Raise the pole	(15)		
04 11 Ream tubing and flush to bottom	(16)		
04 12 Spot cement through pipe	(17)		
04 13 Locate top of cement	(18)		
04 14 Pull pony string	(19)		
04 15 Shoot off tubing	(20)		
04 16 Run cement	(21)		
04 17 Pull tubing	(22)		
04 18 Set bridge below casing seat and cement	(23)		
04 19 Backfill hole or casing to surface	(24)		
04 20 Set 2" monument 3' above ground	(25)		
04 21 Remove pole	(26)		
04 22 Fill overflow pit	(27)		
04 23 Clean up location	(28)		
04 24 Seed location	(29)		
04 25 Submit plugging record	(30)		

PETROLEUM PRODUCTION TASK INVENTORY - 77		CHECK	TIME SPENT
LISTED BELOW ARE A DUTY AND THE TASKS WHICH IT INCLUDES. CHECK ALL TASKS WHICH YOU PERFORM. ADD ANY TASKS YOU DO WHICH ARE NOT LISTED, THEN RATE THE TASKS YOU HAVE CHECKED. DUTY: 05 PUMPING OIL WELLS (ELECTRIC JACK)		✓	1 Very Much Below Average 2 Below Average 3 Slightly Below Average 4 About Average 5 Slightly Above Average 6 Above Average 7 Very Much Above Average
05 01 Select proper tools	(31)		
05 02 Check fire (winter only)	(32)		
05 03 Gauge stock tank	(33)		
05 04 Heat run tank	(34)		
05 05 Maintain gauging records	(35)		
05 06 Report tank ready	(36)		
05 07 Check separator for proper functioning	(37)		
05 08 Check route and pumping schedule	(38)		
05 09 Maintain pumping time book	(39)		
05 10 Check pumping unit	(40)		
05 11 Check well for pumping off	(41)		
05 12 Determine why well is not pumping	(42)		
05 13 Shut off gas stop (if well is not pumping)	(43)		
05 14 Check for casing leak	(44)		
05 15 Pail test well for pumping efficiency	(45)		
05 16 Perform routine maintenance on jack and wellhead	(46)		
05 17 Check electric lines	(47)		
05 18 Report gas leak	(48)		
05 19 Report water leak	(49)		
05 20 Repair water leak	(50)		
05 21 Mow locations and right-of-ways	(51)		

PETROLEUM PRODUCTION TASK INVENTORY - 77		CHECK ✓ If Done	TIME SPENT
LISTED BELOW ARE A DUTY AND THE TASKS WHICH IT INCLUDES. CHECK ALL TASKS WHICH YOU PERFORM. ADD ANY TASKS YOU DO WHICH ARE NOT LISTED, THEN RATE THE TASKS YOU HAVE CHECKED. DUTY: 06 DRILLING OIL, GAS, OR SERVICE WELLS			1 Very Much Below Average 2 Below Average 3 Slightly Below Average 4 About Average 5 Slightly Above Average 6 Above Average 7 Very Much Above Average
06 01 Receive well number and permit	(52)		
06 02 Identify and select tools and equipment needed	(53)		
06 03 Secure well records and/or prognosis	(54)		
06 04 Prepare soil erosion plans	(55)		
06 05 Stake locations	(56)		
06 06 Build roads to location	(57)		
06 07 Clear and grade location	(58)		
06 08 Build slush pit	(59)		
06 09 Set foundations or mud sill timbers	(60)		
06 10 Move in rig	(61)		
06 11 Level machine	(62)		
06 12 Raise mast and guy	(63)		
06 13 Move in derrick house, dog house, etc.	(64)		
06 14 Lay floor	(65)		
06 15 Obtain water, fuel, and electricity	(66)		
06 16 Fill stinger to swivel socket & tighten to stem	(67)		
06 17 Pull in tools and install bit	(68)		
06 18 Install spudding guide	(69)		
06 19 Maintain driller's log	(70)		
06 20 Spud to bedrock	(71)		
06 21 Skid in pipe boat	(72)		
06 22 Set the conductor	(73)		
06 23 Change and tighten the bit	(74)		
06 24 Drill to given casing point	(75)		

PETROLEUM PRODUCTION TASK INVENTORY - 77		CHECK ✓	TIME SPENT
LISTED BELOW ARE A DUTY AND THE TASKS WHICH IT INCLUDES. CHECK ALL TASKS WHICH YOU PERFORM. ADD ANY TASKS YOU DO WHICH ARE NOT LISTED, THEN RATE THE TASKS YOU HAVE CHECKED.			1 Very Much Below Average 2 Below Average 3 Slightly Below Average 4 About Average 5 Slightly Above Average 6 Above Average 7 Very Much Above Average
DUTY: 06 DRILLING OIL, GAS, OR SERVICE WELLS (CONTINUED)			
06 25 Change and tighten the bit	(76)		
06 26 Run casing	(77)		
06 27 Check hole for water	(78)		
06 28 Dress and gauge the bits	(79)		
06 29 Drill to given depth	(80)		
06 30 Check top of sand with steel line	(05:5)		
06 31 Call in well survey/logger	(6)		
06 32 Frac or shoot well	(7)		
06 33 Clean out to bottom	(8)		
06 34 Tear down rig	(9)		
06 35 Move from locations	(10)		
06 36 Clean up location	(11)		

PETROLEUM PRODUCTION TASK INVENTORY - 77		CHECK ✓ If Done	TIME SPENT
LISTED BELOW ARE A DUTY AND THE TASKS WHICH IT INCLUDES. CHECK ALL TASKS WHICH YOU PERFORM. ADD ANY TASKS YOU DO WHICH ARE NOT LISTED, THEN RATE THE TASKS YOU HAVE CHECKED. DUTY: 07 MAINTAINING CENTRAL PUMPING POWER: ELECTRIC PUMPING JACK; OIL, GAS, & WATER LINES; & WATER PRESSURE PLANT			1 Very Much Below Average 2 Below Average 3 Slightly Below Average 4 About Average 5 Slightly Above Average 6 Above Average 7 Very Much Above Average
Central Pumping Power			
07 01 Select and apply proper grease and oil	(12)		
07 02 Maintain proper housekeeping	(13)		
07 03 Check gas pressure	(14)		
07 04 Check cooling system	(15)		
07 05 Check magneto and plugs	(16)		
07 06 Check gears, bearings, and belts	(17)		
07 07 Align and grease rodline posts	(18)		
07 08 Clean and paint when necessary	(19)		
07 09 Maintain proper records	(20)		
07 10 Coordinate numbering of rod lines and jacks	(21)		
07 11 Maintain rod line right-of-ways	(22)		
07 12 Maintain rod lines	(23)		
07 13 Check for loose bolts	(24)		
07 14 Maintain safety charts	(25)		
07 15 Maintain starting unit	(26)		
07 16 Change polish rod liner	(27)		
Electric Pumping Jack			
07 17 Select and apply proper grease and oil	(28)		
07 18 Check electrical circuit	(29)		
07 19 Check gears and bearings	(30)		
07 20 Observe proper safety techniques	(31)		
07 21 Check bridle for wear and replace if necessary	(32)		
07 22 Align and level jack	(33)		

PETROLEUM PRODUCTION TASK INVENTORY - 77		CHECK ✓ If Done	TIME SPENT (1 Very Much Below Average, 2 Below Average, 3 Slightly Below Average, 4 About Average, 5 Slightly Above Average, 6 Above Average, 7 Very Much Above Average)
LISTED BELOW ARE A DUTY AND THE TASKS WHICH IT INCLUDES. CHECK ALL TASKS WHICH YOU PERFORM. ADD ANY TASKS YOU DO WHICH ARE NOT LISTED, THEN RATE THE TASKS YOU HAVE CHECKED. DUTY: 07 MAINTAINING CENTRAL PUMPING POWER, ETC. (CONTINUED)			
07 23 Balance weights and adjust stroke	(34)		
07 24 Maintain proper foundation and drainage	(35)		
07 25 Clean and paint when necessary	(36)		
07 26 Check and replace belts	(37)		
07 27 Change spacing when required	(38)		
07 28 Change pulley for speed adjustment	(39)		
07 29 Maintain electric line right-of-way	(40)		
07 30 Change polish rod liner	(41)		
Oil, Gas, and Water Lines			
07 31 Drain all gas line drips	(42)		
07 32 Check and repair leaks	(43)		
07 33 Observe proper safety procedures	(44)		
07 34 Maintain and record location of lines. stops, and tees	(45)	XX	XXXX
07 35 Check water pressure gauge	(46)		
07 36 Insulate water boxes, well heads and shut offs	(47)		
07 37 Clean freeze pots	(48)		
07 38 Blow gas and water lines	(49)		
07 39 Pressure clean oil lines	(50)		
07 40 Maintain chemical treatment for internal protection	(51)		
07 41 Mow and clear right-of-way	(52)		
Water Pressure Plant			
07 42 Select and apply proper grease and oil	(53)		
07 43 Check water pressure charts and gauges	(54)		

PETROLEUM PRODUCTION TASK INVENTORY - 77		CHECK ✓ If Done	TIME SPENT (1 Very Much Below Average, 2 Below Average, 3 Slightly Below Average, 4 About Average, 5 Slightly Above Average, 6 Above Average, 7 Very Much Above Average)
LISTED BELOW ARE A DUTY AND THE TASKS WHICH IT INCLUDES. CHECK ALL TASKS WHICH YOU PERFORM. ADD ANY TASKS YOU DO WHICH ARE NOT LISTED, THEN RATE THE TASKS YOU HAVE CHECKED. DUTY: 07 MAINTAINING CENTRAL PUMPING POWER, ETC. (CONTINUED)			
07 44 Fill and check chemical feeders	(55)		
07 45 Conduct water sample tests	(56)		
07 46 Observe proper safety procedures	(57)		
07 47 Backwash filter	(58)		
07 48 Clean and paint as necessary	(59)		
07 49 Check water supply wells	(60)		
07 50 Check bearings and packing	(61)		
07 51 Check relief valves	(62)		
07 52 Read and record meter reading	(63)		
07 53 Check engine temperature gauge	(64)		
07 54 Follow down procedure to restart	(65)		
07 55 Number and identify gate valves	(66)		
07 56 Check float valves	(67)		
07 57 Test alarm system	(68)		

PETROLEUM PRODUCTION TASK INVENTORY - 77	CHECK	TIME SPENT
LISTED BELOW ARE A DUTY AND THE TASKS WHICH IT INCLUDES. CHECK ALL TASKS WHICH YOU PERFORM. ADD ANY TASKS YOU DO WHICH ARE NOT LISTED, THEN RATE THE TASKS YOU HAVE CHECKED. DUTY: 08 OIL FIELD PIPE FITTING AND PLUMBING	✓ It Done	1 Very Much Below Average 2 Below Average 3 Slightly Below Average 4 About Average 5 Slightly Above Average 6 Above Average 7 Very Much Above Average
08 01 Cutting to a line with a cross cut saw (69)		
08 02 Trimming pipe with beveling tool (70)		
08 03 Prepare sewer trench (71)		
08 04 Join bituminized fiber pipe (72)		
08 05 Pour bituminous compound (73)		
08 06 Backfill trench (74)		
08 07 Cut steel pipe with a pipe cutter (75)		
08 08 Reaming rigid conduit or pipe with a pipe reamer (76)		
08 09 Threading pipe using pipe dies (77)		
08 10 Make up fittings (78)		
08 11 Operate a portable power machine (79)		
08 12 Thread steel pipe with adjustable receding die (80)		
08 13 Threading pipe with universal die (06:5)		
08 14 Cutting large pipe with power hack saw (6)		
08 15 Transporting acetylene and oxygen cylinders (7)		
08 16 Setting up gas welding equipment (8)		
08 17 Opening and closing the oxy-acetylene equipment for welding (9)	XX	XXXX
08 18 Attaching and lighting a cutting torch (10)		
18 19 Flamecutting with a hand torch (11)		
18 20 Lighting and adjusting the torch and flame (12)		
08 21 Cleaning cutting or welding tips with a tip cleaner (13)		
08 22 Piercing holes with a cutting torch (14)		
08 23 Joining metal by fusion welding with filler rod (15)		

PETROLEUM PRODUCTION TASK INVENTORY - 77	CHECK	TIME SPENT
LISTED BELOW ARE A DUTY AND THE TASKS WHICH IT INCLUDES. CHECK ALL TASKS WHICH YOU PERFORM. ADD ANY TASKS YOU DO WHICH ARE NOT LISTED, THEN RATE THE TASKS YOU HAVE CHECKED. DUTY: 08 OIL FIELD PIPE FITTING AND PLUMBING (CONTINUED)	✓ If Done	1. Very Much Below Average 2. Below Average 3. Slightly Below Average 4. About Average 5. Slightly Above Average 6. Above Average 7. Very Much Above Average
08 24 Strike an arc and run a bead (16)		
08 25 Running a braze bead (17)		
08 26 Cut and ream copper tubing (18)		
08 27 Set up and light prestolite torch (19)		
08 28 Sweat copper tubing (20)		
08 29 Flare copper tubing (21)		
08 30 Swedge copper tubing (22)		
08 31 Bend copper tubing (23)		
08 32 Cut and ream plastic pipe (24)		
08 33 Join flexible plastic tubing (25)		
08 34 Assemble plastic pipe.fittings with solvent (26)		
08 35 Flare plastic pipe (27)		
08 36 Using smooth jawed wrenches (28)		
08 37 Tighten and loosen fasteners with a box end wrench (29)		
08 38 Tightening and loosening fasteners with an open end wrench (30)	XX	XXXX
08 39 Removing pins with a needle nose pliers (31)		
08 40 Tightening and loosening screws with flat screwdriver (32)		
08 41 Tightening and loosening fasteners w/Allen wrenches (33)		
08 42 Holding and tightening with a rib lock plier (34)		
08 43 Cutting a hole in a masonry wall with a star chisel (35)		
08 44 Installing and tightening a union (36)		
08 45 Drilling holes with an electric drill (37)		
08 46 Installing and tightening dresser couplings (38)		

PETROLEUM PRODUCTION TASK INVENTORY - 77	CHECK ✓ If Done	TIME SPENT
LISTED BELOW ARE A DUTY AND THE TASKS WHICH IT INCLUDES. CHECK ALL TASKS WHICH YOU PERFORM. ADD ANY TASKS YOU DO WHICH ARE NOT LISTED, THEN RATE THE TASKS YOU HAVE CHECKED. DUTY: 08 OIL FIELD PIPE FITTING AND PLUMBING (CONTINUED)		1. Very Much Below Average 2. Below Average 3. Slightly Below Average 4. About Average 5. Slightly Above Average 6. Above Average 7. Very Much Above Average
08 47 Using a socket wrench with a ratchet (39)		
08 48 Testing with soap (40)		
08 49 Lighting gas appliances (41)		
08 50 Cutting thin material with a knife (42)		
08 51 Using the basin wrench (43)		
08 52 Using the sink strainer wrench (44)		

PETROLEUM PRODUCTION TASK INVENTORY - 77	CHECK ✓ If Done	TIME SPENT
LISTED BELOW ARE A DUTY AND THE TASKS WHICH IT INCLUDES. CHECK ALL TASKS WHICH YOU PERFORM. ADD ANY TASKS YOU DO WHICH ARE NOT LISTED, THEN RATE THE TASKS YOU HAVE CHECKED. DUTY: 09 OIL FIELD WELDING		1 Very Much Below Average 2 Below Average 3 Slightly Below Average 4 About Average 5 Slightly Above Average 6 Above Average 7 Very Much Above Average
09 01 Set up a portable oxy-acetylene welding rig (45)		
09 02 Light a torch and adjust to the proper flame (46)		
09 03 Assemble different types of oxy-acetylene welding and cutting equipment (47)	XX	XXXX
09 04 Run weld beads in the flat position, with and without filler rod using the forehand technique (48)	XX	XXXX
09 05 Tack the various joints together in preparation for welding (49)	XX	XXXX
09 06 Weld butt joints in the flat position (50)		
09 07 Weld lap joints in the flat position (51)		
09 08 Weld tee joints in the flat position (52)		
09 09 Weld edge and corner welds in the flat position (53)		
09 10 Weld beveled butt joints in the heavy steel plate in the flat position (54)	XX	XXXX
09 11 Weld various joints in the horizontal position (55)		
09 12 Weld various joints in the vertical position on mild sheet steel (56)	XX	XXXX
09 13 Weld various joints in the overhead position (57)		
09 14 Weld steel tubing in the flat position (58)		
09 15 Weld steel tubing in the horizontal fixed position (59)		
09 16 Weld heavy wall steel pipe in the flat position (60)		
09 17 Weld heavy wall steel pipe in the horizontal fixed position (61)	XX	XXXX
09 18 Run braze beads on steel plate in the flat position (62)		

PETROLEUM PRODUCTION TASK INVENTORY - 77	CHECK ✓ If Done	TIME SPENT
LISTED BELOW ARE A DUTY AND THE TASKS WHICH IT INCLUDES. CHECK ALL TASKS WHICH YOU PERFORM. ADD ANY TASKS YOU DO WHICH ARE NOT LISTED, THEN RATE THE TASKS YOU HAVE CHECKED.		1 Very Much Below Average 2 Below Average 3 Slightly Below Average 4 About Average 5 Slightly Above Average 6 Above Average 7 Very Much Above Average
DUTY: 09 OIL FIELD WELDING (CONTINUED)		
09 19 Flat position brazing operation on steel plate (63)		
09 20 Braze various joints in the horizontal position (64)		
09 21 Braze joints in the vertical position (65)		
09 22 Pipe braze-butt joint (66)		
09 23 Braze a tee joint with pipe (67)		
09 24 Braze a cluster joint (68)		
09 25 Silver braze on brass (69)		
09 26 Silver braze various joints in the flat position (70)		
09 27 Silver braze copper tubing in various positions (71)		
09 28 Weld cast iron pipe in the flat position vee-butt joint (72)	XX	XXXX
09 29 Braze cast iron pipe in the flat position, vee-butt joint (73)	XX	XXXX
09 30 Oxyacetylene flame cut mild steel plate (74)		
09 31 Cut straight lines and bevels on plate (75)		
09 32 Pierce a hole in cutting a circle (76)		
09 33 Set up a typical manual arc welder (77)		
09 34 Strike an arc and run stringer bead in the flat position (78)	XX	XXXX
09 35 Run whip beads (79)		
09 36 Run weave beads (80)		
09 37 Make a pad on flat plate (07:5)		
09 38 Make a square butt joint-flat position (6)		
09 39 Make a lap joint-flat position (7)		

PETROLEUM PRODUCTION TASK INVENTORY - 77		CHECK ✓ If Done	TIME SPENT 1 Very Much Below Average 2 Below Average 3 Slightly Below Average 4 About Average 5 Slightly Above Average 6 Above Average 7 Very Much Above Average
LISTED BELOW ARE A DUTY AND THE TASKS WHICH IT INCLUDES. CHECK ALL TASKS WHICH YOU PERFORM. ADD ANY TASKS YOU DO WHICH ARE NOT LISTED, THEN RATE THE TASKS YOU HAVE CHECKED. DUTY: 09 OIL FIELD WELDING (CONTINUED)			
09 40 Make a tee joint-flat position	(8)		
09 41 Make an edge joint-flat	(9)		
09 42 Make a corner joint-flat	(10)		
09 43 Make a single vee butt joint	(11)		
09 44 Run beads-horizontal	(12)		
09 45 Make a butt weld-horizontal	(13)		
09 46 Make a lap joint-horizontal	(14)		
09 47 Make a tee joint-horizontal	(15)		
09 48 Make a corner joint-horizontal	(16)		
09 49 Make a single vee butt joint-horizontal	(17)		
09 50 Run beads-vertical	(18)		
09 51 Weld a square butt joint-vertical	(19)		
09 52 Weld a lap joint-vertical	(20)		
09 53 Weld a corner joint-vertical	(21)		
09 54 Weld a single vee butt-vertical	(22)		
09 55 Weld a double vee butt joint-vertical	(23)		
09 56 Run beads-overhead	(24)		
09 57 Weld a butt joint-overhead	(25)		
09 58 Weld a lap joint-overhead	(26)		
09 59 Weld a tee joint-overhead	(27)		
09 60 Weld a butt joint-pipe	(28)		
09 61 Weld a tee joint-pipe	(29)		
09 62 Run stringer beads on stainless steel	(30)		
09 63 Set up manual TIG welding equipment	(31)		

PETROLEUM PRODUCTION TASK INVENTORY - 77	CHECK ✓ If Done	TIME SPENT
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09 64 Select and prepare the proper tungsten electrode (32)		
09 65 Adjust the machine for aluminum welding (33)		
09 66 Start an arc and run stringer beads on aluminum (34)		
09 67 Run parallel stringer beads on aluminum (35)		
09 68 Make a pad (36)		
09 69 Make a square butt weld in the flat position on aluminum (37)	XX	XXXX
09 70 Make a lap weld on aluminum in the flat position (38)		
09 71 Make fillet welds on aluminum-flat position (39)		
09 72 Make outside corner welds on aluminum-flat position (40)		
09 73 Weld edge joints on aluminum (41)		
09 74 Make stringer beads in the horizontal position (42)		
09 75 Make horizontal butt welds (43)		
09 76 Make horizontal lap welds (44)		
09 77 Make horizontal fillet welds (45)		
09 78 Make horizontal corner welds (46)		
09 79 Make horizontal vee butt joints in heavy plate (47)		
09 80 Make horizontal test plate (48)		
09 81 Weld vertical square butt joints (49)		
09 82 Weld vertical vee butt joints (50)		
09 83 Weld vertical fillet joints (51)		
09 84 Weld vertical lap joints on aluminum (52)		
09 85 Weld stringer beads on aluminum-overhead position (53)		
09 86 Weld overhead butt joints (54)		

PETROLEUM PRODUCTION TASK INVENTORY - 77		CHECK	TIME SPENT
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DUTY: 09 OIL FIELD WELDING (CONTINUED)			
09 87 Weld overhead aluminum lap joints	(55)		
09 88 Weld overhead aluminum tee joints	(56)		
09 89 Weld overhead aluminum vee butt joints	(57)		
09 90 Butt weld aluminum pipe with axis vertical	(58)		
09 91 Butt weld aluminum pipe with axis horizontal	(59)		
09 92 Weld aluminum pipe-lap joint	(60)		
09 93 Weld aluminum pipe-tee joint	(61)		
09 94 Weld aluminum pipe-cluster joint	(62)		
09 95 Set up equipment for welding stainless steel	(63)		
09 96 Weld stainless steel butt joints	(64)		
09 97 Weld stainless steel lap joints	(65)		
09 98 Weld stainless steel fillet joints	(66)		
09 99 Weld stainless steel corner joints	(67)		
09 100 Weld stainless steel pipe	(68)		
09 101 Weld mild steel butt joints	(69)		
09 102 Clean and maintain TIG welding equipment	(70)		
09 103 Service and check the TIG torch	(71)		
09 104 Set up MIG welding equipment; power source	(72)		
09 105 Set up a MIG gun, shielding gas, and work area	(73)		
09 106 Shut down MIG welding equipment and work station	(74)		
09 107 Adjust MIG welding machine for use on mild steel	(75)		
09 108 Run stringer beads on mild steel plate	(76)		
09 109 Build a pad on a mild steel plate	(77)		
09 110 Weld a square butt joint on mild steel; flat position	(78)		

PETROLEUM PRODUCTION TASK INVENTORY - 77	CHECK ✓ If Done	TIME SPENT
LISTED BELOW ARE A DUTY AND THE TASKS WHICH IT INCLUDES. CHECK ALL TASKS WHICH YOU PERFORM. ADD ANY TASKS YOU DO WHICH ARE NOT LISTED, THEN RATE THE TASKS YOU HAVE CHECKED. DUTY: 09 OIL FIELD WELDING (CONTINUED)		1. Very Much Below Average 2. Below Average 3. Slightly Below Average 4. About Average 5. Slightly Above Average 6. Above Average 7. Very Much Above Average
09 111 Weld a lap joint on mild steel, flat position (79)		
09 112 Weld a fillet joint; mild steel, flat position (80)		
09 113 Weld a multiple fillet weld (08:5)		
09 114 Weld a corner joint (6)		
09 115 Weld an edge joint (7)		
09 116 Adjust a MIG welding machine for welding aluminum (8)		
09 117 Run stringer beads on aluminum plate (9)		
09 118 Weld a butt joint on aluminum plate (10)		
09 119 Weld a vee butt joint on aluminum (11)		
09 120 Weld a lap joint on aluminum (12)		
09 121 Weld a fillet joint on aluminum (13)		
09 122 Make an aluminum edge joint (14)		
09 123 Make an aluminum corner joint (15)		
09 124 Make a butt joint on aluminum pipe in the rolled position (16)	XX	XXXX
09 125 Make a butt joint on aluminum pipe in the horizontal fixed position (17)	XX	XXXX
09 126 Make stringer beads on stainless steel plate (18)		
09 127 Make a butt joint on stainless steel (19)		
09 128 Make a lap joint on stainless steel (20)		

PETROLEUM PRODUCTION TASK INVENTORY - 77		CHECK ✓ If Done	TIME SPENT
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DUTY: 10 OIL FIELD CARPENTRY AND MASONRY			
10 01 Lay out stock to length	(21)		
10 02 Lay out stock to width	(22)		
10 03 Cut stock to a line with a handsaw	(23)		
10 04 Drilling holes with a hand drill	(24)		
10 05 Bore holes with brace and auger bit	(25)		
10 06 Drill holes with an electric drill	(26)		
10 07 Drive and remove wood screws with screwdriver	(27)		
10 08 Lay out a 45^{o} angle	(28)		
10 09 Use a sabre saw	(29)		
10 10 Shape stock with a wood rasp	(30)		
10 11 Rip with table saw	(31)		
10 12 Crosscut with radial arm saw	(32)		
10 13 Make and use a pattern	(33)		
10 14 Drive nails with a claw hammer	(34)		
10 15 Pulling nails with the claw hammer	(35)		
10 16 Pulling nails with a nail puller	(36)		
10 17 Whet an edge on a plane iron and wood chisel	(37)		
10 18 Grind a plane or wood chisel	(38)		
10 19 Lay out angles with a framing square	(39)		
10 20 Determine the length of braces or trestle legs	(40)		
10 21 Rip with radial arm saw	(41)		
10 22 Point stakes with a hatchet	(42)		
10 23 Drive stakes with a sledge	(43)		
10 24 Measuring with a steel tape	(44)		

PETROLEUM PRODUCTION TASK INVENTORY - 77	CHECK	TIME SPENT
LISTED BELOW ARE A DUTY AND THE TASKS WHICH IT INCLUDES. CHECK ALL TASKS WHICH YOU PERFORM. ADD ANY TASKS YOU DO WHICH ARE NOT LISTED, THEN RATE THE TASKS YOU HAVE CHECKED. DUTY: 10 OIL FIELD CARPENTRY AND MASONRY (CONTINUED)	✓ If Done	1. Very Much Below Average 2. Below Average 3. Slightly Below Average 4. About Average 5. Slightly Above Average 6. Above Average 7. Very Much Above Average
10 25 Stretch and attach dryline to stakes or nails (45)		
10 26 Set up builder's level (46)		
10 27 Measure or layout horizontal angles with builder's level - transit (47)	XX	XXXX
10 28 Check for level or plumb with a carpenter's level (48)		
10 29 Plumb with the plumb bob (49)		
10 30 Use a portable circular saw (50)		
10 31 Cutting metal with a hack saw (51)		
10 32 Snap line with chalkline (52)		
10 33 Assemble framing members by toenailing (53)		
10 34 Bevel with radial arm saw (54)		
10 35 Lay out pattern for ceiling joists (55)		
10 36 Lay out plum cut and/or level cut on common rafter (56)		
10 37 Miter with a radial saw (57)		
10 38 Make a compound cut with radial saw (58)		
10 39 Set finish or casing nails (59)		
10 40 Cut thin metal with tin shears (60)		
10 41 Scribe an irregular surface with wing dividers or scriber (61)	XX	XXXX
10 42 Toenail tongue and groove footing (62)		
10 43 Cut window glass (63)		
10 44 Glaze a window (64)		
10 45 Use a caulking gun (65)		
10 46 Lay out with scribers (66)		

PETROLEUM PRODUCTION TASK INVENTORY - 77	CHECK	TIME SPENT
LISTED BELOW ARE A DUTY AND THE TASKS WHICH IT INCLUDES. CHECK ALL TASKS WHICH YOU PERFORM. ADD ANY TASKS YOU DO WHICH ARE NOT LISTED, THEN RATE THE TASKS YOU HAVE CHECKED. DUTY: 10 OIL FIELD CARPENTRY AND MASONRY (CONTINUED)	✓ If Done	1. Very Much Below Average 2. Below Average 3. Slightly Below Average 4. About Average 5. Slightly Above Average 6. Above Average 7. Very Much Above Average
10 47 Identify masonry materials (67)		
10 48 Determine methods of measuring materials using a cubic measure (68)	XX	XXXX
10 49 Determine methods for mixing mortar & concrete by hand or machine (69)	XX	XXXX
10 50 Demonstrate techniques of hand and machine mixing (70)		
10 51 Demonstrate proper methods of cleaning mixing equipment (71)	XX	XXXX
10 52 Identify mason, pointing, plaster trowel, plumbing tools, level, line block and straight edges (72)	XX	XXXX
10 53 Identify tape rules, brick hammers, chisels, brick set, points, hammers & strike tool (73)	XX	XXXX
10 54 Cup, pick up, and roll mortar using trowel (74)		
10 55 Butter head joint and bed joint with mortar (75)		
10 56 Spread mortar on brick and head joints (76)		
10 57 Building a one flue chimney with liners (77)		
10 58 Insert a 8" pre-cast lintel over an opening (78)		
10 59 Insert a metal lintel to fit an opening (79)		
10 60 Recognize footing and foundations detail (80)		
10 61 Write specifications for masonry work (09:5)		
10 62 Build a pier battered on four sides (6)		
10 63 Build a battered face pilaster (7)		
10 64 Build a concrete block chimney (8)		

PETROLEUM PRODUCTION TASK INVENTORY - 77	CHECK ✓ If Done	TIME SPENT
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10 65 Construct, lay block in mortar to form concrete block steps (9)	XX	XXXX
10 66 Form and pour concrete slabs (10)		
10 67 Lay a short section of sidewalk (11)		
10 68 Identify tools of cement-mason trade (12)		
10 69 Identify different concrete materials (13)		
10 70 Perform proper measuring methods (14)		
10 71 Perform proper mixing methods (15)		
10 72 Demonstrate methods of building forms (16)		
10 73 Pour concrete sidewalk block (17)		

PETROLEUM PRODUCTION TASK INVENTORY - 77	CHECK ✓ If Done	TIME SPENT (1 Very Much Below Average, 2 Below Average, 3 Slightly Below Average, 4 About Average, 5 Slightly Above Average, 6 Above Average, 7 Very Much Above Average)
LISTED BELOW ARE A DUTY AND THE TASKS WHICH IT INCLUDES. CHECK ALL TASKS WHICH YOU PERFORM. ADD ANY TASKS YOU DO WHICH ARE NOT LISTED, THEN RATE THE TASKS YOU HAVE CHECKED. DUTY: 11 OIL FIELD ELECTRICITY		
11 01 Cut wire (18)		
11 02 Strip a conductor with a knife (19)		
11 03 Strip wire with wire strippers (20)		
11 04 Twist a tap (2 wire) (21)		
11 05 Twist a three wire tap (22)		
11 06 Remove insulation leaving a lead (23)		
11 07 Twist a two wire tap with a lead (24)		
11 08 Twist a three-wire tap with a lead (25)		
11 09 Light a soldering torch (26)		
11 10 Solder connections with a pencil tip propane torch (27)		
11 11 Solder connections with a solder gun (28)		
11 12 Taping conductors (29)		
11 13 Tape a connection with a lead (30)		
11 14 Mount a side bracket wall case (31)		
11 15 Putting drill bit in a drill motor chuck (32)		
11 16 Drill holes in wood studs for Romex, using a portable drill (33)	XX	XXXX
11 17 Install cable (34)		
11 18 Anchor wire by using staples (35)		
11 19 Remove a knockout (K.O.) (36)		
11 20 Strip Romex (37)		
11 21 Clamp cable to wall case (38)		
11 22 Bend a hook eye on wire (39)		
11 23 Connect devices using screws (40)		

PETROLEUM PRODUCTION TASK INVENTORY - 77	CHECK ✓ If Done	TIME SPENT
LISTED BELOW ARE A DUTY AND THE TASKS WHICH IT INCLUDES. CHECK ALL TASKS WHICH YOU PERFORM. ADD ANY TASKS YOU DO WHICH ARE NOT LISTED, THEN RATE THE TASKS YOU HAVE CHECKED.		1 Very Much Below Average 2 Below Average 3 Slightly Below Average 4 About Average 5 Slightly Above Average 6 Above Average 7 Very Much Above Average
DUTY: 11 OIL FIELD ELECTRICITY (CONTINUED)		
11 24 Install ground splice caps (41)		
11 25 Install a light bar hanger (42)		
11 26 Install wire nuts (43)		
11 27 Break off connecting links on a duplex receptacle	XX	XXXX
making a split circuit outlet (44)		
11 28 Install connectors (45)		
11 29 Cut b.x. cable (46)		
11 30 Strip b.x. cable (47)		
11 31 Install an anti-short (48)		
11 32 Cut a hole for a wall case (49)		
11 33 Install box holders (50)		
11 34 Cut large cable or wire (51)		
11 35 Strip cable (52)		
11 36 Measure and mark a line (53)		
11 37 Braid neutral wire (54)		
11 38 Install a weatherhead (55)		
11 39 Strap cable or conduit to wood or wood products (56)		
11 40 Install wood screws (57)		
11 41 Install plastic anchors (58)		
11 42 Install weatherproof connectors (59)		
11 43 Seal weatherproof connectors (60)		
11 44 Install wire in lugs (61)		
11 45 Place tubing in vise (62)		
11 46 Cut tubing or pipe (63)		

PETROLEUM PRODUCTION TASK INVENTORY - 77	CHECK	TIME SPENT
LISTED BELOW ARE A DUTY AND THE TASKS WHICH IT INCLUDES. CHECK ALL TASKS WHICH YOU PERFORM. ADD ANY TASKS YOU DO WHICH ARE NOT LISTED, THEN RATE THE TASKS YOU HAVE CHECKED. DUTY: 11 OIL FIELD ELECTRICITY (CONTINUED)	✓ If Done	1. Very Much Below Average 2. Below Average 3. Slightly Below Average 4. About Average 5. Slightly Above Average 6. Above Average 7. Very Much Above Average
11 47 Place conduit in a bender (64)		
11 48 Install set screw conduit connectors (65)		
11 49 Install compression-type conduit connectors (66)		
11 50 Hold the conduit bender or hickey (67)		
11 51 Bend an offset in conduit up to 1" in diameter (68)		
11 52 Bend an exact 90° stub (69)		
11 53 Bend a kick or offset (70)		
11 54 Cut rigid conduit (71)		
11 55 Ream rigid conduit (72)		
11 56 Thread rigid conduit (73)		
11 57 Install rigid couplings (74)		
11 58 Using the tachometer (75)		
11 59 Connect a starting rheostat to a d.c. motor (76)		
11 60 Reverse a d.c. motor (77)		
11 61 Connect a dynamic brake to a d.c. motor (78)		
11 62 Develop a material list (79)		
11 63 Develop and interpret a work or job sheet (80)		
11 64 Select and inspect proper type of equipment to be used for job (10:5)	XX	XXXX
11 65 Layout and measure equipment positions (6)		
11 66 Fasten equipment using proper types of fasteners (7)		
11 67 Layout wire runs (8)		
11 68 Select and measure proper wire size (9)		
11 69 Shape and bend wire (10)		

PETROLEUM PRODUCTION TASK INVENTORY - 77	CHECK ✓ If Done	TIME SPENT
LISTED BELOW ARE A DUTY AND THE TASKS WHICH IT INCLUDES. CHECK ALL TASKS WHICH YOU PERFORM. ADD ANY TASKS YOU DO WHICH ARE NOT LISTED, THEN RATE THE TASKS YOU HAVE CHECKED. DUTY: 11 OIL FIELD ELECTRICITY (CONTINUED)		1 Very Much Below Average 2 Below Average 3 Slightly Below Average 4 About Average 5 Slightly Above Average 6 Above Average 7 Very Much Above Average
11 70 Make proper electrical connections (11)		
11 71 Make and tape proper types of splices (12)		
11 72 Check complete system by a schematic diagram (13)		
11 73 Test a circuit with a trouble lite (14)		
11 74 Test a circuit with a voltmeter (15)		
11 75 Test a circuit with an ohmmeter (16)		
11 76 Use a clamp-type volt-ammeter in a service installation (17)	XX	XXXX
11 77 Use a clamp-type volt-ammeter in a motor installation (18)	XX	XXXX
11 78 Troubleshoot a relay with a clamp-type volt-ammeter (19)	XX	XXXX
11 79 Measure insulation quality using an insulation tester (20)	XX	XXXX
11 80 Check an armature with a growler (21)		
11 81 Check a stator with a growler (22)		
11 82 Use a tachometer on a motor (23)		
11 83 Check a motor with a vibration indicator (24)		
11 84 Set-up a wheatstone bridge and find the distance to a fault in a phone line (25)	XX	XXXX
11 85 Set-up a recorder on an electrical circuit (26)		

PETROLEUM PRODUCTION TASK INVENTORY - 77	CHECK ✓ If Done	TIME SPENT
LISTED BELOW ARE A DUTY AND THE TASKS WHICH IT INCLUDES. CHECK ALL TASKS WHICH YOU PERFORM. ADD ANY TASKS YOU DO WHICH ARE NOT LISTED, THEN RATE THE TASKS YOU HAVE CHECKED. DUTY: 12 OIL FIELD INTERNAL COMBUSTION ENGINE MECHANICS		1 Very Much Below Average 2 Below Average 3 Slightly Below Average 4 About Average 5 Slightly Above Average 6 Above Average 7 Very Much Above Average
12 01 Identify and use basic hand tools (27)		
12 02 Torque series of studs with a torque wrench (28)		
12 03 Measure four sides of square stock, using an outside micrometer (29)	XX	XXXX
12 04 Measure the inside of a cylinder using an inside micrometer (30)	XX	XXXX
12 05 Measure a flat surface with a dial indicator (31)		
12 06 Determine clearance between two points with a feeler gauge (32)	XX	XXXX
12 07 Measure width and length of flat stock using steel scale (33)	XX	XXXX
12 08 Sharpen a drill bit (34)		
12 09 Sharpen a chisel (35)		
12 10 Grind a screw driver (36)		
12 11 Extract a broken stud (37)		
12 12 Drill and thread a hole (38)		
12 13 Cut and flare a piece of tubing (39)		
12 14 Perform compression check (40)		
12 15 Remove cylinder head from engine assembly in vehicle (41)		
12 16 Service engine valve train (42)		
12 17 Install cylinder head on engine assembly (43)		
12 18 Service valve lifters (44)		
12 19 Ream a cylinder ridge (45)		
12 20 Remove connecting rod cap and bearing (46)		

PETROLEUM PRODUCTION TASK INVENTORY - 77		CHECK ✓ If Done	TIME SPENT
LISTED BELOW ARE A DUTY AND THE TASKS WHICH IT INCLUDES. CHECK ALL TASKS WHICH YOU PERFORM. ADD ANY TASKS YOU DO WHICH ARE NOT LISTED, THEN RATE THE TASKS YOU HAVE CHECKED.			1. Very Much Below Average 2. Below Average 3. Slightly Below Average 4. About Average 5. Slightly Above Average 6. Above Average 7. Very Much Above Average
DUTY: 12 OIL FIELD INTERNAL COMBUSTION ENGINE MECHANICS (CONTINUED)			
12 21 Remove piston assembly	(47)		
12 22 Remove old piston ring	(48)		
12 23 Clean ring grooves and oil holes	(49)		
12 24 Fit piston rings	(50)		
12 25 Install piston rings	(51)		
12 26 Install ring compressor	(52)		
12 27 Install piston assembly	(53)		
12 28 Measure crankshaft journal	(54)		
12 29 Install connecting rod cap and bearing	(55)		
12 30 Check diameter of crankshaft journal	(56)		
12 31 Remove and replace main bearing caps and bearings	(57)		
12 32 Remove valve timing assembly	(58)		
12 33 Remove flywheel and bell housing assembly	(59)		
12 34 Remove control rods, cables and tubing	(60)		
12 35 Remove engine mountings	(61)		
12 36 Hoist engine from chassis	(62)		
12 37 Remove and inspect camshaft from engine assembly in vehicle	(63)	XX	XXXX
12 38 Install camshaft in engine assembly	(64)		
12 39 Remove and install crankshaft	(65)		
12 40 Install valve timing assembly	(66)		
12 41 Drain oil	(67)		
12 42 Service oil filter cap	(68)		
12 43 Replace filter	(69)		

PETROLEUM PRODUCTION TASK INVENTORY - 77	CHECK ✓ If Done	TIME SPENT (1 Very Much Below Average, 2 Below Average, 3 Slightly Below Average, 4 About Average, 5 Slightly Above Average, 6 Above Average, 7 Very Much Above Average)
LISTED BELOW ARE A DUTY AND THE TASKS WHICH IT INCLUDES. CHECK ALL TASKS WHICH YOU PERFORM. ADD ANY TASKS YOU DO WHICH ARE NOT LISTED, THEN RATE THE TASKS YOU HAVE CHECKED.		
DUTY: 12 OIL FIELD INTERNAL COMBUSTION ENGINE MECHANICS (CONTINUED)		
12 44 Refill crankcase with oil and check for leaks (70)		
12 45 Remove and replace oil pan (71)		
12 46 Remove and reinstall oil pump (72)		
12 47 Test cooling system pressure (73)		
12 48 Drain and replace engine coolant (74)		
12 49 Replace radiator hoses (75)		
12 50 Remove and replace radiator (76)		
12 51 Remove, inspect and replacing cooling system thermostat (77)	XX	XXXX
12 52 Remove and replace cooling system fan assembly (78)		
12 53 Remove and replace cooling system belts (79)		
12 54 Check and adjust cooling system belts (80)		
12 55 Service vehicle coolant recovery system (11:5)		
12 56 Service vehicle heater water hoses (6)		
12 57 Service vehicle heater vacuum hoses (7)		
12 58 Remove and replace heater core (8)		
12 59 Service secondary cables (9)		
12 60 Service spark plugs (10)		
12 61 Service ignition distributor (11)		
12 62 Test ignition coil (12)		
12 63 Service distributor cap and spark plug wires (13)		
12 64 Check and reset ignition timing (14)		
12 65 Check fuel pump for proper pressure and capacity (15)		
12 66 Service carburetor fuel filter (16)		

PETROLEUM PRODUCTION TASK INVENTORY - 77		CHECK ✓	TIME SPENT
LISTED BELOW ARE A DUTY AND THE TASKS WHICH IT INCLUDES. CHECK ALL TASKS WHICH YOU PERFORM. ADD ANY TASKS YOU DO WHICH ARE NOT LISTED, THEN RATE THE TASKS YOU HAVE CHECKED. DUTY: 12 OIL FIELD INTERNAL COMBUSTION ENGINE MECHANICS (CONTINUED)			1 Very Much Below Average 2 Below Average 3 Slightly Below Average 4 About Average 5 Slightly Above Average 6 Above Average 7 Very Much Above Average
12 67 Service carburetor automatic choke	(17)		
12 68 Rebuild carburetor	(18)		
12 69 Service manifold heat control	(19)		
12 70 Service exhaust emission control units	(20)		
12 71 Service carburetor air cleaner	(21)		
12 72 Remove and replace exhaust manifold	(22)		
12 73 Remove and replace exhaust pipe	(23)		
12 74 Remove and replace muffler	(24)		
12 75 Remove and replace tail pipe	(25)		
12 76 Service vehicle fuel tank	(26)		
12 77 Remove and replace clutch assembly	(27)		
12 78 Install a throwout bearing	(28)		
12 79 Inspect and/or replace a pilot bearing	(29)		
12 80 Inspect fly wheel and check for runout	(30)		
12 81 Adjust clutch free play	(31)		
12 82 Replace transmission mounting	(32)		
12 83 Remove and replace manual transmission	(33)		
12 84 Rebuild manual transmission	(34)		
12 85 Adjust shift linkage	(35)		
12 86 Service speedometer cable	(36)		
12 87 Perform operational transmission inspection	(37)		
12 88 Inspect drive shaft, universal joints and intermediate carrier bearing	(38)	XX	XXXX
12 89 Remove and replace drive shaft	(39)		

PETROLEUM PRODUCTION TASK INVENTORY - 77	CHECK	TIME SPENT
LISTED BELOW ARE A DUTY AND THE TASKS WHICH IT INCLUDES. CHECK ALL TASKS WHICH YOU PERFORM. ADD ANY TASKS YOU DO WHICH ARE NOT LISTED, THEN RATE THE TASKS YOU HAVE CHECKED. DUTY: 12 OIL FIELD INTERNAL COMBUSTION ENGINE MECHANICS (CONTINUED)	✓ If Done	1 Very Much Below Average 2 Below Average 3 Slightly Below Average 4 About Average 5 Slightly Above Average 6 Above Average 7 Very Much Above Average
12 90 Rebuild universal joint (40)		
12 91 Perform drive shaft operational inspection (41)		
12 92 Lubricate universal joints (42)		
12 93 Remove and replace rear axle shaft (43)		
12 94 Remove and replace axle shaft bearing and seals (44)		
12 95 Remove and replace differential assembly (45)		
12 96 Replace bearings on ring gear case and pinion shaft (46)		
12 97 Adjust ring gear to pinion lash (47)		
12 98 Replace pinion shaft seal and/or flange (48)		
12 99 Remove and replace differential friction clutches (49)		
12 100 Lubricate ball joints and tie rod ends (50)		
12 101 Check oil level in standard transmission and rear end (51)	XX	XXXX
12 102 Visually inspect undercarriage (52)		
12 103 Check all fluid levels under hood (53)		
12 104 Lubricate door checks and hinges (54)		
12 105 Visually inspect under hood (55)		
12 106 Remove and replace shock absorbers (56)		
12 107 Remove and repair rear springs (57)		
12 108 Recondition front suspension components (58)		
12 109 Check tires for abnormal wear and proper pressure (59)		
12 110 Remove tire and wheel and change or repair tire (60)		
12 111 Rotate tires (61)		
12 112 Balance wheels (62)		

PETROLEUM PRODUCTION TASK INVENTORY - 77	CHECK	TIME SPENT
LISTED BELOW ARE A DUTY AND THE TASKS WHICH IT INCLUDES. CHECK ALL TASKS WHICH YOU PERFORM. ADD ANY TASKS YOU DO WHICH ARE NOT LISTED, THEN RATE THE TASKS YOU HAVE CHECKED.	✓	1. Very Much Below Average 2. Below Average 3. Slightly Below Average 4. About Average 5. Slightly Above Average 6. Above Average 7. Very Much Above Average
DUTY: 12 OIL FIELD INTERNAL COMBUSTION ENGINE MECHANICS (CONTINUED)		
12 113 Adjust caster, camber and toe in (63)		
12 114 Remove and recondition manual steering gear (64)		
12 115 Remove and recondition steering pump (65)		
12 116 Remove and recondition steering column (66)		
12 117 Remove all brake drums (67)		
12 118 Turn a brake drum (68)		
12 119 Change brake shoes (69)		
12 120 Rebuild wheel cylinders (70)		
12 121 Rebuild master cylinder (71)		
12 122 Bleed and adjust brakes (72)		
12 123 Remove disc brake caliper and replace disc brake pads (73)	XX	XXXX
12 124 Recondition caliper (74)		
12 125 True disc brake rotor using brake drum lathe (75)		
12 126 Remove and recondition power brake booster units (76)		
12 127 Test charging system (77)		
12 128 Test and repair generator (78)		
12 129 Repair and adjust voltage regulator (79)		
12 130 Test alternator (80)		
12 131 Repair and replace alternator (12:5)		
12 132 Check starting motor and controls (6)		
12 133 Service starting motor and controls (7)		
12 134 Service battery (8)		
12 135 Charge a battery (9)		

PETROLEUM PRODUCTION TASK INVENTORY - 77		CHECK ✓ If Done	TIME SPENT
LISTED BELOW ARE A DUTY AND THE TASKS WHICH IT INCLUDES. CHECK ALL TASKS WHICH YOU PERFORM. ADD ANY TASKS YOU DO WHICH ARE NOT LISTED, THEN RATE THE TASKS YOU HAVE CHECKED. DUTY: 12 OIL FIELD INTERNAL COMBUSTION ENGINE MECHANICS (CONTINUED)			1. Very Much Below Average 2. Below Average 3. Slightly Below Average 4. About Average 5. Slightly Above Average 6. Above Average 7. Very Much Above Average
12 136 Test and service head lamp circuits	(10)		
12 137 Test and service parking lamp circuit	(11)		
12 138 Service back-up lamp circuit	(12)		
12 139 Test and service horn circuit	(13)		
12 140 Service interior lighting circuits	(14)		
12 141 Adjust and aim head lamps	(15)		
12 142 Test and service exterior miscellaneous lighting		XX	XXXX
devices	(16)		
12 143 Service blower motors	(17)		
12 144 Test and service instrument panel gauges	(18)		
12 145 Service and adjust safety switches	(19)		
12 146 Service vehicle cigar lighter circuit	(20)		
12 147 Test and service heater switches	(21)		
12 148 Test and service air conditioning switches	(22)		
12 149 Service ignition key reminder circuit	(23)		
12 150 Remove and replace speedometer	(24)		
12 151 Test and service directional signal circuit	(25)		

PETROLEUM PRODUCTION TASK INVENTORY - 77	CHECK ✓ If Done	TIME SPENT
LISTED BELOW ARE A DUTY AND THE TASKS WHICH IT INCLUDES. CHECK ALL TASKS WHICH YOU PERFORM. ADD ANY TASKS YOU DO WHICH ARE NOT LISTED, THEN RATE THE TASKS YOU HAVE CHECKED. DUTY: 13 OILFIELD TRACTOR AND BULLDOZER OPERATIONS		1. Very Much Below Average 2. Below Average 3. Slightly Below Average 4. About Average 5. Slightly Above Average 6. Above Average 7. Very Much Above Average
13 01 Check oil, fuel, and coolant (26)		
13 02 Set brakes (27)		
13 03 Determine if tractor is out of gear (28)		
13 04 Start engine (29)		
13 05 Lift blade (30)		
13 06 Select proper gear (31)		
13 07 Engage clutch (32)		
13 08 Select speed (33)		
13 09 Adjust blade (34)		
13 10 Run rough grade (35)		
13 11 Remove required amount of soil (36)		
13 12 Run fine grade (37)		
13 13 Disengage clutch, remove from gear and set brakes (38)	XX	XXXX
13 14 Place winch in gear (39)		
13 15 Select proper winch speed (40)		
13 16 Manipulate clutch (41)		
13 17 Run winch line on drum properly (42)		
13 18 Select and apply proper lubricants (43)		
13 19 Perform proper maintenance according to schedule (44)		
13 20 Observe proper safety procedures (45)		

SECTION II
TOOLS & EQUIPMENT

PETROLEUM PRODUCTION BRADFORD AREA HIGH SCHOOL PETR
OLEUM PRODU
CTION BRADFORD AREA HIGH SCHOOL PETROLEUM PRODUCTI
ON BRADFORD

PETROLEUM PRODUCTION TASK INVENTORY - 77		CHECK ✓ If Done	TIME SPENT (1. Very Much Below Average 2. Below Average 3. Slightly Below Average 4. About Average 5. Slightly Above Average 6. Above Average 7. Very Much Above Average)
LISTED BELOW ARE A DUTY AND THE TASKS WHICH IT INCLUDES. CHECK ALL TASKS WHICH YOU PERFORM. ADD ANY TASKS YOU DO WHICH ARE NOT LISTED, THEN RATE THE TASKS YOU HAVE CHECKED. DUTY: TOOLS AND EQUIPMENT USAGE			
01 Air Compressor with Tank, Hoses and Blow Guns	(46)		
02 Anvil	(47)		
03 Auger bit set - 1/4, 5/16, 3/8, 7/16, 1/2, 9/16, 5/8,		XX	XXXX
11/16, 3/4, 13/16, 7/8, 15/16 and 1"	(48)		
04 Auger handle	(49)		
05 Augers, ship - 1/2, 5/8, 3/4, 7/8, 1:	(50)		
06 Axe	(51)		
07 Axes, 2 flint edge double bit	(52)		
08 Baler	(53)		
09 Bars	(54)		
10 Bars, Pinch - 5'	(55)		
11 Bar, Round Point Telegraph (Digging)	(56)		
12 Bar, Wrecking	(57)		
13 Bits, Auger	(58)		
14 Bit and Cutters, expansive - 7/8 to 1-3/4 and		XX	XXXX
1-3/4 to 3:	(59)		
15 Bit gauges	(60)		
16 Blocks, Rope - set 3 x 2	(61)		
17 Block, Tubing	(62)		
18 Blocking	(63)		
19 Bolt Dies - 1/4" to 1"	(64)		
20 Brooms	(65)		

PETROLEUM PRODUCTION TASK INVENTORY - 77		CHECK ✓ If Done	TIME SPENT
LISTED BELOW ARE A DUTY AND THE TASKS WHICH IT INCLUDES. CHECK ALL TASKS WHICH YOU PERFORM. ADD ANY TASKS YOU DO WHICH ARE NOT LISTED, THEN RATE THE TASKS YOU HAVE CHECKED. DUTY: TOOLS AND EQUIPMENT USAGE (CONTINUED)			1 Very Much Below Average 2 Below Average 3 Slightly Below Average 4 About Average 5 Slightly Above Average 6 Above Average 7 Very Much Above Average
21 Brushes, Paint	(66)		
22 Brushes, Wire	(67)		
23 Brush Hook, No. 10	(68)		
24 Carpenter's steel square - 2'-24" x 2" body	(69)		
25 Casing pole	(70)		
26 Casing rope	(71)		
27 Chains - different sizes, different lengths	(72)		
28 Chain binder	(73)		
29 Chain hoist and crane	(74)		
30 Chains, log	(75)		
31 Chain Saw	(76)		
32 Chain Tongs	(77)		
33 Chisels, cold - 1/2, 5/8, 3/4, 1:	(78)		
34 Chisels, Diamond Point - 1/8, 1/4, 3/8:	(79)		
35 Chisels, Half Round - 1/8, 1/4, 3/8"	(80)		
36 Chisels, Wood	(13:5)		
37 Circle Jack and Handle	(6)		
38 Come-a-longs	(7)		
39 Derrick Stove	(8)		
40 Digger, Post Hole	(9)		

PETROLEUM PRODUCTION TASK INVENTORY - 77		CHECK	TIME SPENT
LISTED BELOW ARE A DUTY AND THE TASKS WHICH IT INCLUDES. CHECK ALL TASKS WHICH YOU PERFORM. ADD ANY TASKS YOU DO WHICH ARE NOT LISTED. THEN RATE THE TASKS YOU HAVE CHECKED.		✓ = Done	1 Very Much Below Average 2 Below Average 3 Slightly Below Average 4 About Average 5 Slightly Above Average 6 Above Average 7 Very Much Above Average
DUTY: TOOLS AND EQUIPMENT USAGE (CONTINUED)			
41 Drill, Heavy Duty Portable Electric - 3/8"	(10)		
42 Drill, Heavy Duty Portable Electric - 1-1/2"	(11)		
43 Drill Press, Floor or Bench Type	(12)		
44 Elevators	(13)		
45 Elevators, Rod - 5/8"	(14)		
46 Elevators, Tubing - 2"	(15)		
47 Files, Flat, Double Cut - 6" - 8" - 12" - 14"	(16)		
48 Files, Half Round - (Same as above)	(17)		
49 Files, Mill, Single cut flat - (Same as above)	(18)		
50 Files, Round - (Same as above)	(19)		
51 Fishing Tools	(20)		
52 Flaring & Cutting Tool Kit, copper tubing	(21)		
53 Forge	(22)		
54 Forgery Jack & Handle	(23)		
55 Fuse Puller	(24)		
56 Grinder, Heavy Duty Ball Bearing D. E. Bench -		XX	XXXX
6" - 8"	(25)		

PETROLEUM PRODUCTION TASK INVENTORY - 77		CHECK	TIME SPENT
LISTED BELOW ARE A DUTY AND THE TASKS WHICH IT INCLUDES. CHECK ALL TASKS WHICH YOU PERFORM. ADD ANY TASKS YOU DO WHICH ARE NOT LISTED. THEN RATE THE TASKS YOU HAVE CHECKED.		✓	1 Very Much Below Average 2 Below Average 3 Slightly Below Average 4 Above Average 5 Slightly Above Average 6 Above Average 7 Very Much Above Average
DUTY: TOOLS AND EQUIPMENT USAGE (CONTINUED)			
57 Hacksaw	(26)		
58 Hammer, ball peen (different sizes)	(27)		
59 Hammer, cross peen	(28)		
60 Hammers, lead	(29)		
61 Hammers, ripper (Ball face-straight claws)	(30)		
62 Hand Taps-high speed steel, standard N.C. 1 each of		XX	XXXX
both taper and bottoming taps - 1/4, 3/8, 1/2, 5/8,		XX	XXXX
3/4, 7/8, and 1:	(31)		
63 Head, Pipe Driving - 2"	(32)		
64 Hoist-Chain, Coffin, 1-1/2 to 2 ton capacity	(33)		
65 Jack, come-a-long	(34)		
66 Jacks, Electric	(35)		
67 Jack, Hydraulic - 1-1/2 ton	(36)		
68 Jack plane, 12" or 14"	(37)		
69 Jack, Track, 22" - 15 ton	(38)		
70 Jars, Rod, Set	(39)		
71 Ladders	(40)		
72 Level, aluminum - 24"	(41)		
73 Lever grease guns (cartridge type)	(42)		
74 Light Plant	(43)		

PETROLEUM PRODUCTION TASK INVENTORY - 77		CHECK ✓	TIME SPENT
LISTED BELOW ARE A DUTY AND THE TASKS WHICH IT INCLUDES. CHECK ALL TASKS WHICH YOU PERFORM. ADD ANY TASKS YOU DO WHICH ARE NOT LISTED. THEN RATE THE TASKS YOU HAVE CHECKED.			1 Very Much Below Average 2 Below Average 3 Slightly Below Average 4 About Average 5 Slightly Above Average 6 Above Average 7 Very Much Above Average
DUTY: TOOLS AND EQUIPMENT USAGE (CONTINUED)			
75 Mattock	(44)		
76 Measuring line	(45)		
77 Oil cans	(46)		
78 Pick	(47)		
79 Pick, Railroad or Clay	(48)		
80 Pipe cutter	(49)		
81 Pipe reamer	(50)		
82 Pipe vises, malleable iron combination	(51)		
83 Pipe vise, yoke bench	(52)		
84 Pliers, Channel Lock	(53)		
85 Pliers, Diagonal Cutting	(54)		
86 Pliers, Lineman's Heavy	(55)		
87 Pliers, Lineman's Insulated Side Cutting	(56)		
88 Pliers, Needle Nose	(57)		
89 Pulley, Snatch Block - 10" dia.	(58)		
90 Pulling Pole and Tools	(59)		
91 Punches, Center	(60)		
92 Punches, Set Drive Pin (all sizes)	(61)		
93 Putty Knives	(62)		

PETROLEUM PRODUCTION TASK INVENTORY - 77		CHECK ✓	TIME SPENT
LISTED BELOW ARE A DUTY AND THE TASKS WHICH IT INCLUDES. CHECK ALL TASKS WHICH YOU PERFORM. ADD ANY TASKS YOU DO WHICH ARE NOT LISTED, THEN RATE THE TASKS YOU HAVE CHECKED. DUTY TOOLS AND EQUIPMENT USAGE (CONTINUED)			1 Very Much Below Average 2 Below Average 3 Slightly Below Average 4 About Average 5 Slightly Above Average 6 Above Average 7 Very Much Above Average
94 Ratchet Bit Brace - 10" sweep	(63)		
95 Reamers	(64)		
96 Rod Wheel	(65)		
97 Rope socket	(66)		
98 Rope, soft	(67)		
99 Saw, Hand-Crosscut	(68)		
100 Saw, Hand-Rip	(69)		
101 Saw, Heavy Duty Portable Electric - 3/4"	(70)		
102 Saw, One Man Crosscut	(71)		
103 Saw, Pruning - 24" blade	(72)		
104 Scrapers, Paint or Wall	(73)		
105 Screw Extractors, small and large	(74)		
106 Screwdrivers, Phillips - assorted sizes	(75)		
107 Screwdrivers, Regular - assorted sizes	(76)		
108 Screw pitch gauge for pipe, nuts and screws	(77)		
109 Scythe	(78)		
110 Scythestones, Crystolen - 12"	(79)		
111 Short stroke jars	(80)		
112 Shovel, Round Point	(14:5)		
113 Shovel, Square Point	(6)		
114 Slack Tub	(7)		
115 Sledge, cross peen	(8)		

PETROLEUM PRODUCTION TASK INVENTORY - 77		CHECK ✓ If Done	TIME SPENT (1 Very Much Below Average, 2 Below Average, 3 Slightly Below Average, 4 About Average, 5 Slightly Above Average, 6 Above Average, 7 Very Much Above Average)
LISTED BELOW ARE A DUTY AND THE TASKS WHICH IT INCLUDES. CHECK ALL TASKS WHICH YOU PERFORM. ADD ANY TASKS YOU DO WHICH ARE NOT LISTED, THEN RATE THE TASKS YOU HAVE CHECKED.			
DUTY: TOOLS AND EQUIPMENT USAGE (CONTINUED)			
116 Sledge, straight peen	(9)		
117 Sledge hammer	(10)		
118 Snaths	(11)		
119 Socket, Fishing	(12)		
120 Soldering gun	(13)		
121 Stakes, steel	(14)		
122 Stem	(15)		
123 Stem guide	(16)		
124 Stoving post	(17)		
125 Swivel head	(18)		
126 Tape-Rules - 10'	(19)		
127 Tape, steel - 100'	(20)		
128 Taper pipe taps - high speed steel, standard		XX	XXXX
1/8, 1/4, 3/8, 1/2, 3/4, 1, 1-1/4, 1-1/2, 2:	(21)		
129 Threader	(22)		
130 Tin snips, heavy - 12 to 14"	(23)		
131 Tongs, tubing	(24)		
132 Tongs, tubing, set of (2" pipe)	(25)		
133 Tongs, tubing, set of (2" collar backup)	(26)		
134 Tools, assorted drilling	(27)		
135 Twist drill set, straight shank high speed, steel		XX	XXXX
1/16" to 1/2" by 64ths	(28)		

PETROLEUM PRODUCTION TASK INVENTORY - 77		CHECK ✓ If Done	TIME SPENT
LISTED BELOW ARE A DUTY AND THE TASKS WHICH IT INCLUDES. CHECK ALL TASKS WHICH YOU PERFORM. ADD ANY TASKS YOU DO WHICH ARE NOT LISTED, THEN RATE THE TASKS YOU HAVE CHECKED. DUTY: TOOLS AND EQUIPMENT USAGE (CONTINUED)			1 Very Much Below Average 2 Below Average 3 Slightly Below Average 4 About Average 5 Slightly Above Average 6 Above Average 7 Very Much Above Average
136 Twist drills, 1/2" straight shank, high speed		XX	XXXX
9/16", 5/8, 11/16, 3/4, 13/16, 7/8, 15/16, 1"		XX	XXXX
and 1-1/16"	(29)		
137 Volt-Ammeter, AC	(30)		
138 Welder, 300 amp. (complete with accessories)	(31)		
139 Welding & Cutting Outfit (complete with		XX	XXXX
accessories)	(32)		
140 Wrench, Cresent	(33)		
141 Wrench, Monkey - 12" or 14"	(34)		
142 Wrench, Pumper's	(35)		
143 Wrench Set - 1-1/2" Sq. Drive - 12 point socket	(36)		
144 Wrenches, Adjustable	(37)		
145 Wrenches, Pipe	(38)		
146 Wrenches, Rod	(39)		
147 Wrenches, Straight Pattern Pipe	(40)		
148 Wrenches, Vise-Grip	(41)		